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COMPUTERWORLD

Inside

CHIPS
Intel's Pentium debuts today and should appear in systems by the middle of May. The chip, which faces a tough battle against RISC microprocessors, will allow systems vendors to deliver powerful platforms for downsizing host-based applications to client/server networks. *Page 2*

CLIENT/SERVER
Users like the ease of use of **Oracle**'s new integrated client/server tool kit but are still waiting for precise pricing and packaging data. *Page 4*

DISASTER RECOVERY
The recent East Coast blizzard closes a data center responsible for handling transactions at 5,000 automated teller machines nationwide. *Page 6*

MANAGEMENT
Business analysts trained in operations research can be a secret weapon in a CIO's quest for bottom-line results. Experts say IS executives must learn to exploit the talents of these mathematical wizards. *Page 63*

IBM tries user-based host pricing

Decision-support software tapped first

By Johanna Ambrosio
SAN FRANCISCO

IBM last week revealed its first attempt at user-based pricing for a mainframe application. If this trial meets with user acceptance, IBM may use the model for other mainframe applications, executives said.

Although different parts of IBM are trying various software pricing models, last week's disclosure marked the company's first public admission that user-based pricing could become more widespread for IBM mainframe software.

Users said they welcome the change of heart. George Sekely, president of CSX Technology, Inc. in Jacksonville, Fla., said, "IBM is starting to act more like a PC software company. If the price is sufficiently low, wonderful. It allows us

IBM, *page 12*

Unix rivals unite

By Maryfran Johnson
SAN FRANCISCO

■ The endorsement last week of a single "Unix dashboard" by six of the industry's powerhouses could produce a common set of standards by mid-1994 that would enable users to build open systems architectures without worrying about whose technologies they are using.

However, the stunning show of unity at UniForum 1993, ostensibly aimed at easing customer frustrations with the Unix industry, had a more pressing motivation: to ward off the evil eye of Microsoft Corp.'s Windows NT 32-bit operating system.

Agreeing to deliver a Common Open Software Environment — dubbed "Cozy" — across their Unix platforms were IBM, Hewlett-Packard Co., Sun Microsystems, Inc., Unix System Laboratories, Inc., The Santa Cruz Operation and Univel, Inc., a subsidiary of Novell, Inc.

In addition to offering users the same look and feel across heterogeneous desktop systems, the vendors also pledged to adhere to a consistent set of desktop application programming interfaces, common networking products and a variety of existing and emerging standards in graphics, multimedia and object technology (see story page 14).

Five years of pitched battle among the Unix camps, however, has left users unwilling to jump for joy at the first signs of cooperation or common sense. Cozy, they pointed out, is one of many efforts undertaken since the late 1980s aimed at Unix unification.

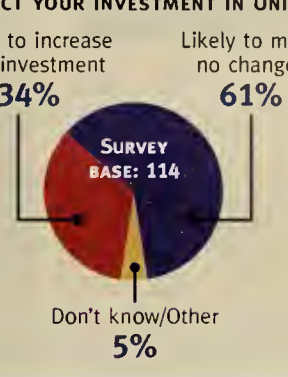
"It sure sounds like a good thing,

Unix, *page 14*

Lukewarm

Only about one-third of respondents said the common set of open systems interfaces would cause them to invest more heavily in Unix

HOW WILL THIS ANNOUNCEMENT AFFECT YOUR INVESTMENT IN UNIX?



Source: *Computerworld* Database Division

Wireless intrigues IS executives, but technical obstacles stunt use

By Joanie M. Wexler
NEW YORK

Despite their zeal for the "virtual corporation," many firms are ruefully acknowledging that the technology that will eventually let employees carry their offices around with them in an integrated computer/communications device is still in its infancy.

Stumbling blocks to implementing the virtual corporation today, they said, include security, bandwidth, convenience and concerns about the safety of today's wireless networking schemes.

Information systems and networking professionals from all walks of corporate life attended a conference here last week sponsored by Boston-based consultancy The Yankee Group and *Computerworld*. They indicated they are hungry for wireless networking and discussed innovative applications they are already planning or testing. But most said they would wait for the resolution of these outstanding issues before implementing wide-scale deployment.

For example, Stephen R. Schoenfeld, managing director at Lehman Brothers, told attendees that he is testing wireless electronic mail and local-area networking on trading floors to help

Wireless, *page 8*

Portable offices

While companies are anxious to untether employees, unresolved issues with wireless technology will prevent an explosion in the virtual office for at least two years

	Projected number of U.S. users			
	1993	1994	1995	1996
Cellular (voice and data)	13M	16M	19M	22M
Personal communications systems (voice)	100,000	500,000	1M	1.5M
Paging	15.2M	17.2M	19.2M	22M
Wireless packet data services	1.3M	1.7M	2.5M	3.3M
Mobile computers	23,000	75,000	255,000	795,000
Personal digital assistants (voice and data)	2,000	22,000	94,000	289,000

Source: The Yankee Group
CW Chart: Janell Genovese

◀ A blend of cellular, personal communications, paging and laptop technologies is creating a new breed of employee: the mobile professional. However, in 1992, only half a million of some 36.5 million mobile devices in use were data-oriented.

Multiprocessing

Hyatt ups open systems

By Mark Halper
CHICAGO

■ Hyatt Hotels Corp. will soon select a multiuser Unix server to handle a quantum leap in reservation volume that will kick in as the hotel expands its central booking process and enters the reservation outsourcing business.

DAVID JOEL

Hyatt's Gordon Kerr *seeks more MIPS*

Gordon Kerr, senior vice president of MIS, said Hyatt will decide by mid-May whether to transfer its Spirit reservation system to Pyramid Technology Corp.'s MIServer ES, the Hewlett-Packard Co. Corporate Business System or NCR Corp.'s 3550.

The company currently runs Spirit on a 12-processor version of AT&T's Pyramid-made 7000 over an Informix Corp. database, but two pending business changes will push the 7000 beyond its limits.

Hoping to capitalize on a void left by the collapse of the AMR Corp.-led Confirm reservation project, Hyatt is seeking customers in the lodging industry, Kerr said.

However, Hyatt's

Hyatt, *page 16*

Newspaper

CHIP SIMONS

▲The television of the not-so-distant future could be a couch potato's dream come true: a voice-controlled appliance with the smarts of a PC and the audiovisual quality of a movie screen. Page 29.

In this issue

UNIFORUM

IS professionals struggling with the move to open systems computing met at **UniForum 1993** last week to discuss how to compensate for shortcomings in systems management, security and other areas. *Page 14.* **Lotus** tells customers that **Notes for Unix** has been delayed until the second half of 1993. *Page 15.* **IBM**'s new **Unix** relational database, announced last week, gives users a unique stepping-off point for re-engineering mainframe applications for client/server systems, but analysts said it still doesn't match rival products. *Page 12*

PC SOFTWARE

Microsoft's Hermes system management technology is turning heads at recent demonstrations. The **Windows** NT-based server software allows managers to perform custom installations across a network and maintain detailed inventories of PC software. *Page 37.* **WordPerfect** will today announce the first major upgrade to its flagship DOS word processor in three years. *Page 10*

CW GUIDE

When 'server' means 'file server,' memory, storage and speed are paramount. When you're looking for a machine to do heavy-duty database serving, the purchase checklist changes to scalability, bottleneck handling, reliability and manageability. Users evaluate the market-leading RISC servers from **DEC**, **DG**, **IBM**, **HP** and **Sun**. *Page 67*

VIEWPOINT

Work-flow tools can do a lot to make processes more efficient and more adaptable, says columnist **Esther Dyson**, but they can't accomplish much if the people using them don't really understand them or the way work is accomplished. *Page 33*

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A PUBLICATION OF IDG

Pentium roars to starting gate

Intel chip faces battle to achieve server dominance

By Michael Fitzgerald
SANTA CLARA, CALIF.

■ Intel Corp. rules the desktop, but it has yet to prove itself in the high-end server market, where systems ranging from high-end reduced instruction set computing (RISC)-based workstations to traditional mainframes are potential competitors.

Intel hopes to squelch the competition with Pentium, its next-generation microprocessor, for which it will announce technical details today. Intel officials said systems vendors will be able to ship limited numbers of Pentium systems starting May 17.

"We're starting the whole downsizing/rightsizing thing, and it's a battle of RISC vs. Pentium," said Louis Gutentag, information systems director at Milbank, Tweed, Hadley & McCloy, a New York law firm that has its back-office applications on an IBM mainframe. "I can buy RISC systems today and solve my problem, but we'll need Intel systems for things like document management. I'm trying to avoid running a dual platform shop" after downsizing, he said.

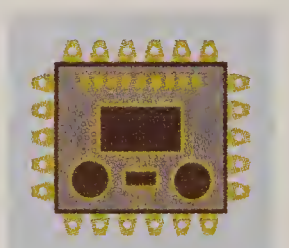
Gutentag, who as a member of Intel's Corporate Advisory Board has seen a demonstration of Pentium-based systems, said the chip's speed was impressive.

Intel is billing Pentium, designed with RISC-like features such as a superscalar architecture to greatly improve processing speed, as a CPU that will let users bring large systems applications into a client/server desktop environment. It also has mainframe-type features.

However, performance marks its long suit: The 66-MHz version of Pentium will run up to 70% faster than current top-of-the-line Intel systems.

"You can now put a two- or four-processor Pentium system together, and in terms of computing power you're equal to the largest ES/9000," said Virgil Hornstein, director of North American systems product marketing at Compaq Computer Corp. Compaq will move its Tri-Flex server architecture down from the SystemPro XL to ProSignia and DeskPro/M products in order to take advantage of Pentium, Hornstein said.

Intel officials and users agreed, however, that it will take time for the software vendors to catch up to the new capabilities of Pentium. Pentium was designed to work well in a multiple processor system environment, but little software is currently available to take advantage of these types of systems.



Faster chip
The Pentium Pipelined Floating Point Unit can run floating point-intensive applications five to 10 times faster than the I486 CPU, with which it is compatible. Pentium users will find enormous performance boosts in applications such as financial analysis, engineering simulation, modeling and spreadsheets.

Intel's Curt Nichols, marketing director for Pentium, said Intel recognizes that downsizing mission-critical applications "requires advanced operating systems, and we're not developing Pentium in a vacuum." He pointed to The Santa Cruz Operation's SCO Unix, Microsoft Corp.'s Windows NT, Next, Inc.'s NextStep and IBM's OS/2 2.1 as operating systems that will be optimized for Pentium.

Current software, however, will have to be recompiled to realize Pentium's full performance benefits. Pentium-optimized applications, when they appear, will also run on existing Intel platforms.

"I expect we'll use some Pentium desktops for our mapping applications, but we'll primarily use them as servers," said John Miller, director of office systems technology at GTE Telephone Operations in Irving, Texas, and another member of the advisory board.

Intel will also announce today its Peripheral Component Interface chip set for Pentium. This is a local bus designed to allow users to link hard drives, graphics and other peripherals directly to the processor and should further enhance Pentium system performance if vendors adopt it.

DEC names second source for Alpha

By Melinda-Carol Ballou
MAYNARD, MASS.

Digital Equipment Corp. further legitimized its Alpha AXP strategy last week when it announced a deal with Mitsubishi Electric Corp. to act as a long-awaited second source for the Alpha chip.

Although user reaction to the announcement was generally positive, five out of 21 users reached for comment by *Computerworld* last week said such an agreement would be stronger if DEC had signed on a well-known U.S. chip maker.

"Personally, the main reason I care about this is that it may strengthen Alpha's position in the marketplace," said John Osudar, a computer scientist at Argonne National Laboratory in Argonne, Ill.

"While any second source is good, a household name would have been better," added Bill Mayhew, chairman of the Digital Equipment Computer Users Society.

Mitsubishi will begin producing the chips in the 1994 time frame built around DEC designs, and it will produce chips based on its own designs thereafter, according to DEC officials.

Industry analysts were upbeat about the development.

"Mitsubishi is not a proven force in the 32-bit processor market, but they are a capable semiconductor manufacturer and should not have any trouble producing the DEC-designed chips, particularly given a time frame of almost two years," said Michael Slater, editor of the "Microprocessor Report," which is published in Sebastopol, Calif.

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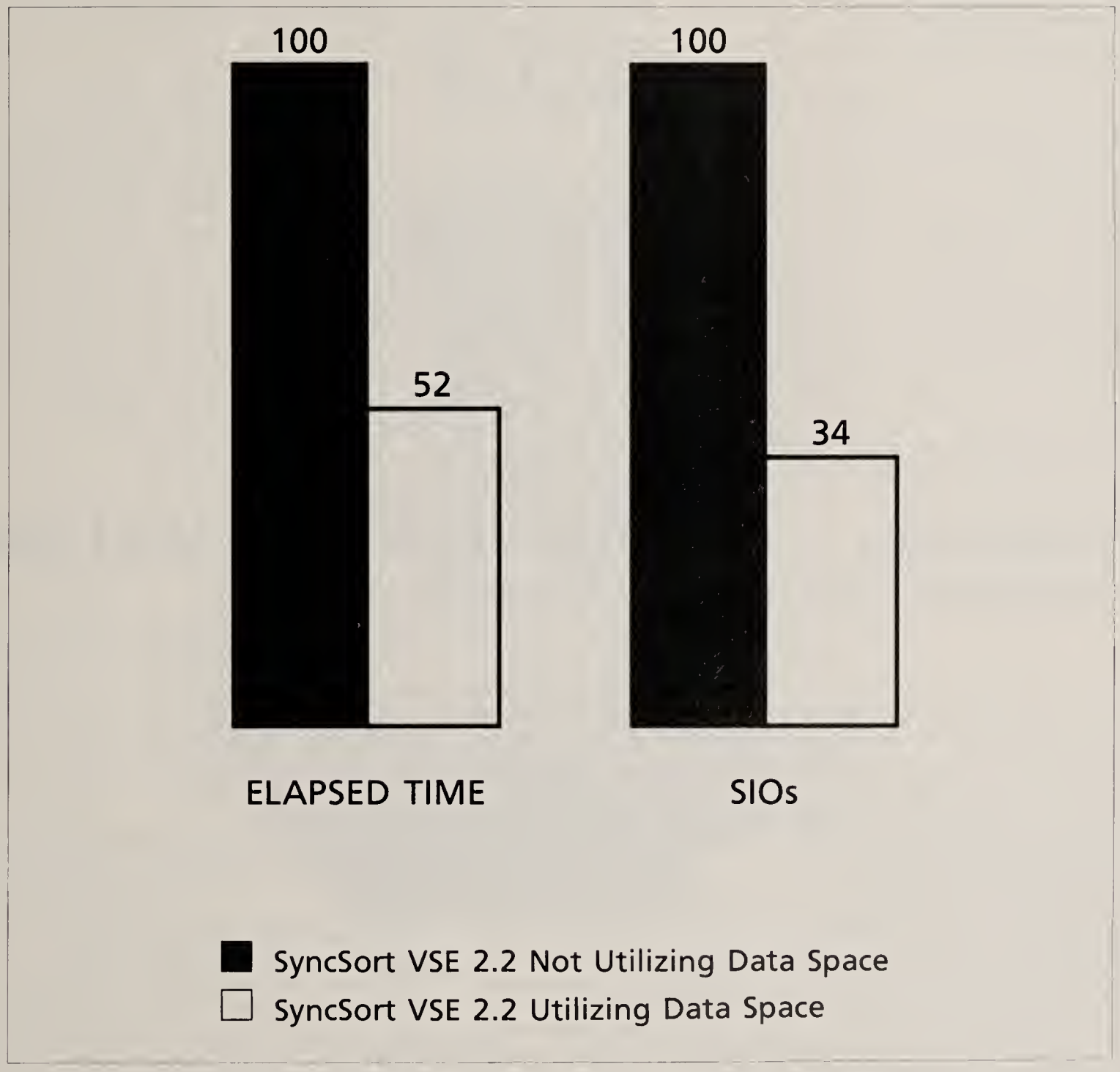

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Client/server tools

Oracle wins kudos, hears concerns

By Jean S. Bozman
SAN FRANCISCO

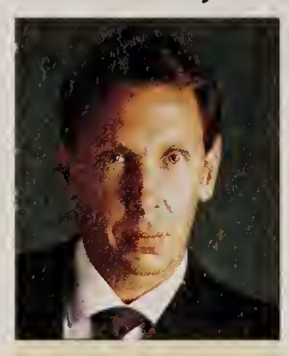
At bicoastal rollouts last week, users lauded Oracle Corp.'s graphical client/server tools for their projected ease of use. But as comprehensive as the 14 integrated tools are, users noticed one key ingredient was missing: prices.

That is because Oracle has yet to publish prices for the Cooperative Development Environment (CDE). Oracle executives later told *Computerworld* the firm would provide a price list before the tool set ships in June. "We'll have that established in the next month or two," said Jerry Baker, senior vice president of Oracle's Product Line Division.

CDE prices are still under discussion. "We are completely revamping the pricing structure of the tools," said Farzad Dibachi, senior director of CDE product marketing.

Dibachi said the bundled CDE tools would be priced at approximately $20,000 but that prices would vary according to platform. In contrast, he said, current character-based Oracle computer-aided software engineering (CASE) tools alone are priced at $18,000. However, a Microsoft Corp. Windows version of CDE will be priced much lower than $20,000, he said, and runtime versions of the CDE tools will be priced at several hundred dollars.

Even before CDE ships in June, users can buy the current crop of Oracle tools and then upgrade to CDE tools at no cost, provided they have paid a maintenance fee, Dibachi said. Baker said users will have the option of buying a single, bundled package of CDE tools or an assortment of separate modules, such as the Oracle's Browser and CASE tools.



Oracle CEO Lawrence Ellison

By July, Oracle users will have three ways to access data stored in IBM's DB2 database:
- Oracle's SQLConnect gateway links Oracle servers to DB2.
- New "transactional triggers" allow CDE tools to directly address DB2.
- Microsoft's Open Database Connectivity application programming interface links Oracle clients with the DB2 server.

In the absence of a price list, users and analysts guessed last week that a fully equipped developers' tool kit would cost $20,000 to $30,000. That is comparable to the cost of an integrated CASE tool set, said Donald DePalma, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. But the price is considerably more than the cost of Windows tools from Gupta Corp. and Powersoft Corp., which are installed at many Oracle sites.

Some users said they are very interested in seeing a final price list. "The tool set was received very positively, but I'm concerned that it could easily cost $30,000 to completely outfit a developer's workstation, including the CASE tools," said Warren Capps, director of Oracle systems and training at federal contractor STR Corp. in Reston, Va., who attended a Washington, D.C.-area briefing. "That's as much as the cost of hiring a programmer."

Early CDE user Garrett Suhm, a project leader at Westinghouse Savannah River Co. in Aiken, S.C., said he prefers flexible pricing for runtime versions because "we don't want 100 boxes of tools to come here. We want one box, and we'll deploy it on the Novell server."

The high degree of integration among CDE tools is expected to boost productivity. CDE applications can be developed once, then deployed on many platforms whether they host character-based or graphical user interface screens [CW, March 15]. The integration of the forms and report writer tools will save time formerly spent capturing and displaying answers to SQL queries, users said.

Key ingredient

Access to multiple databases scattered throughout large organizations is expected to be a key selling point. Oracle users will be able to build applications that run directly against IBM's DB2 and SQL/DS relational databases, said Dennis Moore, product marketing manager for CDE. Future versions will address more database engines.

Oracle Chief Executive Officer Lawrence Ellison told the audience at the New York unveiling of CDE that programmer productivity is a major benefit of the integrated tool set. "CDE is designed to get you away from having to write lines of code," Ellison said.

Users agreed. "CDE cuts application development to a matter of days," said James Bennett, vice president of the technology division for CDE beta-test site First National Bank of Chicago, which has developed Oracle applications that run against IBM's DB2. "It's an impressive product."

Senior editor Michael Vizard contributed to this story.

Novell cuts tags, adds function to desktop Unix

By Michele Dostert
SAN JOSE, CALIF.

Novell, Inc.'s Univel desktop Unix subsidiary fired another salvo in the 32-bit PC operating system wars last week by slashing the price and boosting the application base of its UnixWare personal and application server products.

Univel dropped the price of its UnixWare Personal Edition to $249, a 50% cut. It also slashed prices on the UnixWare Application Server (48%) and Software Development Kit (40%) to $1,299 and $599, respectively.

UnixWare can partition a disk into UnixWare, DR DOS 6.0 and Windows partitions.

The price cuts make UnixWare competitive with IBM's OS/2 2.0, which is priced from $195 to $270. Microsoft Corp. has not yet announced pricing for Windows NT.

Univel also expanded UnixWare Personal Edition's ability to run DOS and Windows applications. UnixWare already comes bundled with Novell's DR DOS 6.0 to let users run DOS applications. Now, any PC with Windows can use UnixWare's new Windows Merge capability to support Windows 3.0 and 3.1.

"Adding Windows support means UnixWare now has a very broad application base; it can run familiar DOS and Windows packages as well as complex, powerful Unix [System V, Release 4] applications," said Stan Schatt, an analyst at Computer Intelligence/InfoCorp in Santa Clara, Calif.

UnixWare can now partition a user's disk into UnixWare, DR DOS 6.0 and Windows partitions. The user can then install any DOS, Windows or Unix application.

Jeff Byrne, Univel's product marketing manager, said that with these partitions in place, most Windows functions run natively, using the Intel Corp. chip instruction set; the Windows graphical interface is automatically mapped over to an X Window System interface.

NT moves to next test phase

By Christopher Lindquist
REDMOND, WASH.

■ Microsoft Corp. has begun rolling out the second beta-test release of Windows NT, and testers are anxiously awaiting what they hope will be a near production-ready version of the operating system that fixes many of the flaws in the previous release.

Several beta-test users contacted had not received their copy of the new beta-test release as of last week but said they are eager to see if it meets their expectations. And at least one waiting tester said his company planned on moving the second beta-test version into some production situations as it became feasible.

That user, Doug Farmer, lead for local-area network administration and systems integration in information services at Chevron Canada Ltd. in Vancouver, British Columbia, said his company is part of the Advanced Server beta-test program. He said the demonstrations it has seen of the Advanced Server component has left staff members "pretty excited."

NT Advanced Server includes a variety of features for larger networks, including LAN Manager for Windows NT, built-in fault tolerance and centralized network administration.

Farmer described his organization as a "fairly big LAN Manager shop" and said the tight link between operating system and the basic layers of networking should make life easier. "Those lower layers are now invisible, so you don't get all hot and heavy about them," he said.

Other users were quick to tick off several items they said they hope to see improved in the latest release:
- Better support for DOS and 16-bit Windows applications.
- Increased overall performance.
- Enhanced Transmission Control Protocol/Internet Protocol connectivity.
- Increased support for Systems Network Architecture connectivity.
- Improved support for Novell, Inc.'s NetWare.

Realistic benchmarking

Microsoft has claimed that all of these issues are being addressed in the new release. Indeed, the company has said that the Beta 2 release is sufficiently tuned for realistic benchmarking to be performed on it, something it said should not be done with the earlier beta-test copy.

DOS and Windows 16-bit support in the first beta-test version was known to be unstable, a fact Microsoft had acknowledged to users before it shipped.

"[DOS and 16-bit Windows] support is there, but it's not real solid" in the October beta-test release, said Louis Kahn, network administrator at the Centers for Disease Control in Atlanta.

Kahn said he hopes support improves to the point that he can put Windows NT on user desktops. "We're hoping that it will be a nice, smooth transition between Windows 3.1 and Windows NT," he said.

Developers have at least one more hurdle in their move from the first to the second beta-test release, however: The new one also includes a new executable format — one that will require developers to recompile their Windows NT applications.

While this will no doubt cause some concern among developers and users as they attempt to get all their software up to speed, David Thatcher, Microsoft's group product manager for Windows NT, said developers are forewarned.

"The product that we're shipping now is supposed to be as close as we can get to the final," Thatcher said. This will be the final version of the executable, so it should not cause problems when Windows NT actually ships, he added.

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News Shorts

First Mac clone debuts

NuTek USA, a small Silicon Valley start-up, has begun selling a PC that the firm claims nearly duplicates the functionality of the **Apple Computer, Inc.** Macintosh. The $2,996 Duet computer is a "workalike" machine that NuTek will target at mixed Macintosh and IBM environments, according to President Benjamin Chou. The company will also sell circuit boards that manufacturers can install on IBM-compatible machines that will allow them to run Macintosh software, he added. Apple officials vowed to aggressively defend their property rights if they are impugned.

PowerBook said to get pen input

Apple has slated an autumn introduction of a version of its PowerBook portable that can use a pen as well as a keyboard to enter and manipulate data, according to a published report. **Grid Systems Corp.** and **NEC Corp.** currently sell machines that employ both pens and keyboards. Apple is delaying its introduction while waiting for the pen market to grow. The systems are expected to be priced between $2,100 to $4,000, depending on configuration.

CompuAdd abandons retailing

CompuAdd Computer Corp. said it would abandon the retail channel in favor of its direct marketing arm. The Austin, Texas, PC maker has 110 stores that sell CompuAdd systems and a variety of peripherals and software. The $525 million company scaled back its plans to expand to 200 stores last year and will close all of its retail stores by year's end.

Next president resigns

Next, Inc. last week announced the departure of Peter van Cuylenburg, president and second-in-command. Next officials said van Cuylenburg's exit was related to the downsizing of the firm, which last month scrapped its hardware business in favor of pushing its NextStep operating system. At least a half-dozen high-level executives have departed the Redwood City, Calif., company in the past year.

JWP leaves PCs behind

JWP, Inc. is on its way out of the information services business. The Rye Brook, N.Y., firm, which doubled its revenue to roughly $2 billion with its August 1991 purchase of PC distributor **Businessland, Inc.**, late last week put its $1.7 billion PC services unit on the block. JWP cited the extreme volatility in the PC market and a need to refocus on its original core business, mechanical and electrical services, as its reasons.

SHORT TAKES **Microsoft Corp.** Chairman Bill Gates will reportedly unveil MS-DOS 6.0 at a user group meeting in San Francisco on March 30. The updated version of DOS includes enhancements such as integral data compression and improved memory optimizers.... In a cost-saving victory for U.S. computer makers, the Department of Commerce declined to maintain an 87% import tariff on South Korean dynamic random-access memory chips.... **Digital Equipment Corp.** unhooked the X.400-based electronic-mail portion of its TeamLinks for Windows office automation software and is selling it separately for $49 per user.... **Compaq Computer Corp.** Senior Vice President H. Douglas Johns resigned unexpectedly last week to pursue "family and personal business interests." Compaq President Eckhard Pfeiffer will assume Johns' role until a successor is found.... **Hewlett-Packard Co.** announced a 42M-byte version of its Kittyhawk 1.3-in. hard disk, priced at $499.

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Disaster recovery

ATMs frozen by blizzard

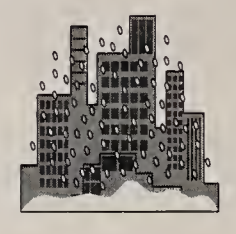
By Kim S. Nash
CLIFTON, N.J.

Heavy snows from the blizzard that recently blanketed the East Coast caused the roof of Electronic Data Systems Corp.'s data center here to cave in on March 13, leaving customers of 5,000 automated teller machines (ATM) without electronic access to their bank accounts for several days.

The 13 ATM networks that shut down are not expected to be up until later this week, when EDS moves a large installation of fault-tolerant Tandem Computers, Inc. machines to a new data center that it has leased from AT&T in Rochelle Park, N.J. Until then, bank-card holders must find an ATM on one of 18 other networks that EDS signed up to do substitute processing.

Downed networks include four owned by EDS: MPACT in Texas, Instant Teller in California, Easy Answer in Illinois and Exchange, which operates in the U.S. and internationally. Others include Money, AFFN and TX.

EDS declined to say whether it has a disaster recovery plan to cover the Tandem installation. The company does have a contract with Comdisco Disaster Recovery Services, Inc. in Rosemont, Ill., for IBM computers at the data center that are peripheral to the ATM network. After the disaster, Comdisco offered EDS use of IBM computers and networks at two sites in Northern New Jersey and made a Tandem site in Illinois available, even though the latter was not part of the contract.



However, EDS opted to go its own way, partially because one of the backup locations offered by Comdisco was already crowded with firms knocked out of their usual digs by the World Trade Center bombing. Looking for a new site close to the original data center "cost us only half a day to a day" of recovery time, said Jon Senderling, an EDS spokesman.

Local authorities prevented EDS employees from recovering equipment from the collapsed data center until late last week, so the company gathered extra machines from various EDS sites across the U.S. Meanwhile, EDS arranged for temporary ATM help from 18 other networks, gradually giving bank-card users access to their accounts through alternate ATMs. By late last week, 98% of the affected customers had some kind of access, Senderling said.

The system should return to normal later this week, according to a source inside an EDS operations center in Southern California, although Senderling would not confirm that target.

Although the ATM outage has been inconvenient for bank customers, EDS anticipates no problems with data loss or damage, Senderling said, because it did a controlled shutdown before evacuating the mangled data center. "All our account data is intact," he said.

Mid-Atlantic correspondent Thomas Hoffman contributed to this report.

Mellon Bank to sell off IS services

Accounting Services, Data-Link, Datacenter up for grabs

By Nell Margolis
PITTSBURGH

Mellon Bank Corp., which has spent the last year denying it is exiting the outsourcing business, last week took a major step toward turning the rumors into fact.

A spokeswoman at the bank confirmed that investment banker Goldman, Sachs & Co. has been hired to help Mellon sell a hefty chunk of its information systems division. The three business units on the block — Mellon Accounting Services, Data-Link and Datacenter — provide outsourcing services to trusts businesses, financial institutions and mortgage banking operations.

Still in the stable: commercial (nonbanking and finance) outsourcing. That unit is responsible for servicing Mellon's largest outsourcing contract, a multiyear deal with National Steel Corp.

The bank is also hanging on to a raft of hardware and telecommunications resources that now serve, among others, the three units on their way out. Computer services tie-ins with Mellon, the spokeswoman said, are not an explicit part of the offers for sale; whether they become so, she said, will depend on the eventual buyers and the deals they negotiate.

As of press time, no formal negotiations were afoot, according to Mellon. Speculation as to who might line up for a slice of Mellon IS went into high gear days before last week's formal announcement and continued to mass around Milwaukee-based M&I Data Services, Inc. The IS arm of banking software and services purveyor Marshall & Ilsley Corp., M&I Data Services is widely regarded as a premier-quality niche player. Its software strengths could be wed to Mellon IS' estimated 750-bank customer base with minimal pain and intriguing profit potential, said George DiNardo, formerly Mellon's highest ranked IS executive and now a consultant at Coopers & Lybrand. Both Mellon and M&I Data Services declined to comment.

Mellon at a glance

IS budget:	$208.5 million
IS staff:	1,500
Processor value:	$63 million
Number of PCs and terminals:	20,000

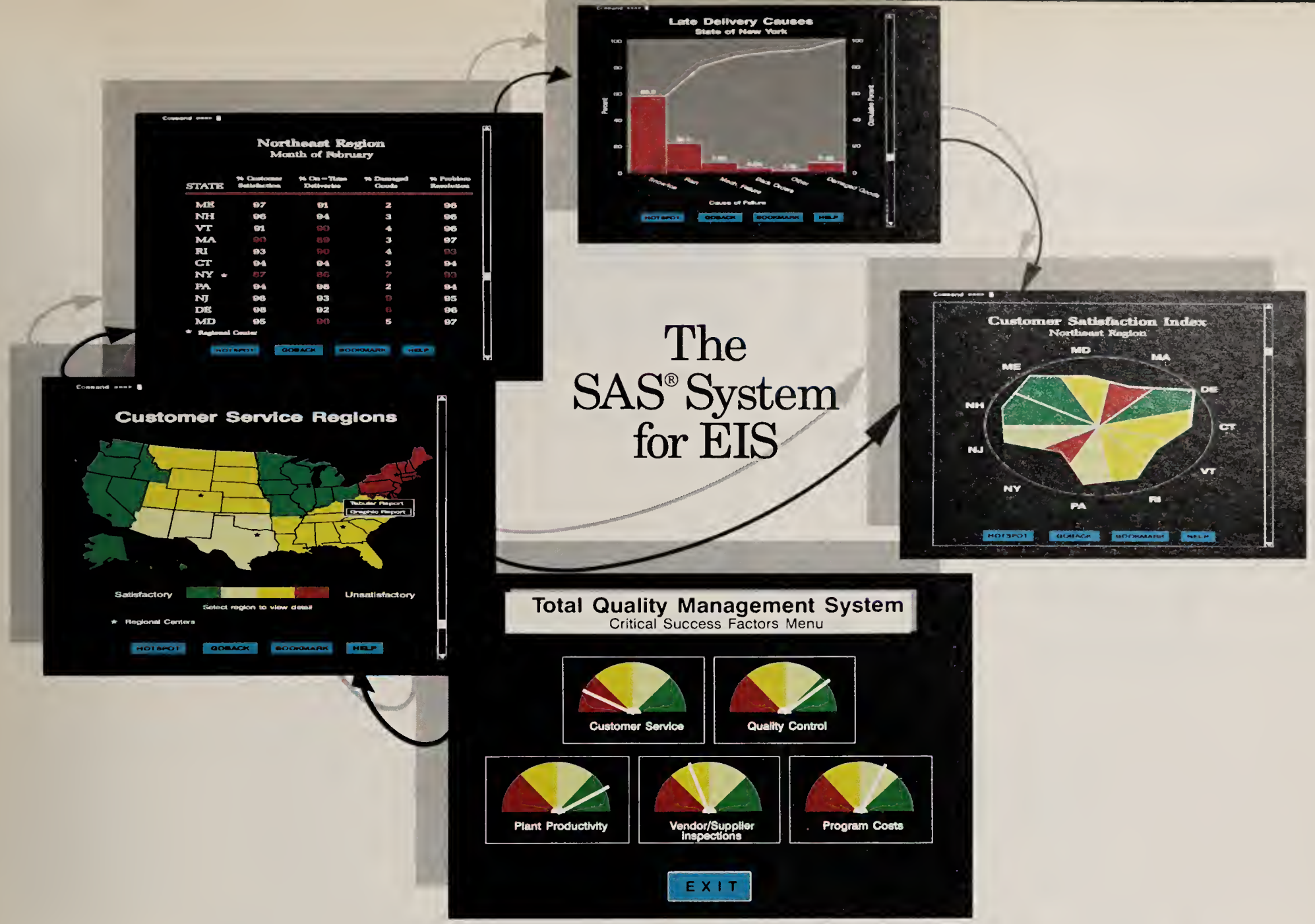
Source: *Computerworld Premier 100*

According to the Mellon spokeswoman, the sell-off is no sellout of either outsourcing or IS; rather, it is an effort to further hone an already sharpened focus on core activities and fee-based businesses with robust growth curves.

Taken together, the three units contributed roughly 5% of Mellon's overall $2.1 billion revenue last year. According to New Orleans-based banking analyst M. Arthur Gillis, they kicked in closer to 45% of Mellon IS' 1992 revenue.

However well it may serve the bank's bottom line, Gillis said, a for-sale sign in that large a piece of Mellon IS turf also signals a major distancing of the bank from its once sought-after identity as a technology services provider.

Mellon, several analysts noted, was into outsourcing well before the bandwagon took off in the late 1980s. Moreover, Gillis said, its tactic of eschewing megadeals for a large quantity of modest but solid service contracts added up to a sizable revenue base. "Some 750 banks as outsourcing clients is nothing to sneeze at," Gillis said. "Systematics [a banking software and services house based in Little Rock, Ark.] has about 1,100, and they're considered a giant."



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Enterprise computing

Mac servers to finally debut

By James Daly
HANNOVER, GERMANY

Apple Computer, Inc. will this week launch its biggest push yet for the corporate market when it introduces its first true dedicated Macintosh servers.

The Workgroup Server 60, Workgroup Server 80 and Workgroup Server 95 will be unveiled Thursday at the CeBIT Computer Fair here. It will immediately target workgroups that range from five to 200 workers.

Analysts said the absence of a server has hurt Apple's corporate sales. Although Apple's high-end Quadra Macintosh certainly had the power to work as a server, Apple never positioned it as such and hence added on a lot of the gadgets and functionality expected in a more general-purpose machine.

Apple hopes to use the Macintosh's reputation for ease of use to sell the workgroup servers to businesses entwined in the challenges of creating a client/server architecture.

The client/server strategy has proved attractive to large information systems shops because it unifies all computing services, but building and managing such a setup has proved tricky. "You can't belittle Apple's ease-of-use argument, especially when dealing with client/server," said Jim Groff, senior director of Apple's Enterprise Systems Division.

Analysts said they believe simplifying the aggravating job of server setup and administration could save big money. A cost/benefit analysis issued in January by Gartner Group, Inc.'s Consulting Services in Stamford, Conn., said the life-cycle cost of maintaining a Macintosh for five years is $4,000 less than a PC running Microsoft Corp.'s Windows and nearly $10,000 lower than a DOS system.

"The primary reasons for the Macintosh cost advantage were its superior ease of installation, use and learning as well as its transparent networking," the report states.

Those are administrative issues that users can relate to. "When I think of running a Unix server, I think of seven systems programmers constantly running around trying to keep the thing going," said Brian Comnes, manager of the information center at DHL Airways, Inc. in Redwood City, Calif. "So if Apple can provide a plug-and-play box in which we can do a lot of nifty things without a lot of fuss, it could change our lives significantly."

But questions remain about how well the servers will work using software to connect them to Novell, Inc.'s NetWare, which accounts for more than 70% of the market. "That's the big question: How well it will work with Novell," Comnes said. "It just had better work well."

Apple's lateness in addressing the server market could hurt its cause — but the damage may not be irreversible, analysts said.

"The PowerBook was very late to the portable computer market, but it did such a good job in terms of ergonomics and performance that it took off like a rocket," said Pieter Hartsook, editor of "The Hartsook Letter," a Macintosh-specific newsletter in Alameda, Calif.

Insiders also said they expect Apple to ultimately introduce workgroup servers targeted for specific tasks. The company has already begun to go down that road with the Workgroup Server 95, which will have an optional configuration designed specifically for a database environment. "Apple owns the whole ball of wax, from the operating system to the hardware, so it would be very easy to do," Hartsook said.

Apple will simultaneously introduce two new versions of its AppleShare software for high-performance file-and-print services. The vendor will also reach out to the DOS and Windows environments with the introduction of AppleTalk Connection for DOS and Windows, which will let PC users access files stored on the new servers as well as other AppleShare servers.

Servers up

Apple's new servers run the gamut

	Workgroup Server 60	Workgroup Server 80	Workgroup Server 95
Chip	20-MHz 68040	33-MHz 68040	33-MHz 68040
RAM	8M to 68M bytes	8M to 136M bytes	16M to 256M bytes
Hard drive	230M- or 500M-byte	500M- or 1G-byte	230M-, 500M- or 1G-byte
Ship date	Summer	Summer	April
Starting price	$3,079	$6,399	$7,589

Source: Apple Computer, Inc. CW Chart: Michael Siggins

Apple picking
Oracle Corp. is one of several major relational database management system vendors that will soon announce support and products for the new Apple servers.

Wireless

CONTINUED FROM PAGE 1

Lehman Brothers increase its 250 million to 350 million daily trades to 1 billion.

A pen computing/wireless combination replaces a complicated series of phone calls and paper-passing procedures in place today for executing trades, he explained, and eliminates several time-consuming and error-prone steps.

Schoenfeld said that while the small pilot has trimmed trade-execution time from 90 seconds — "a lifetime in our business" — to about five, "we're not 100% sure about security. It's too early to tell if an outsider could pick off our data."

Mike McKenna, vice president at Citibank NA, agreed: "Security is nonexistent today" for wireless networking, which "doesn't cut it for a financial services firm processing 17 different credit cards and more than 30 million accounts." Also, he said, while great strides have been made with wireless hardware, "software [application] integration with the hardware" is in an embryonic stage.

The availability of bandwidth to support applications that hum along on high-speed wired LANs is also an unknown — and one that will persist until the Federal Communications Commission and Congress determine how they will allocate wireless spectrum. In fact, Schoenfeld said, Lehman Brothers has not yet determined whether there will be sufficient bandwidth for sending groundswells of trading traffic at peak periods to its multiple brokerage houses simultaneously.

Less work
Cellular giant McCaw Cellular estimated that members of today's work force invest a month more per year in their jobs than workers in 1970 did. However, the generation entering the work force today is not of the 70-hour-a-week mind-set, according to Metropolitan Property and Casualty President Daniel J. Cavanagh, who views mobile and wireless technologies as a possible solution. He sees real-time voice and data interaction among employees such as claims adjusters as a way of combining several tasks in one on-line effort, which could keep employees from piles of after-hours paperwork and thus shorten the workday.

"It would not be fair for firms to have to queue up" and for some to receive information later than others, Schoenfeld said.

Health concerns

Holding back other users, such as Raymond S. Perry, chief information officer at Avon Products, Inc., in Rye, N.Y., are concerns about the safety and convenience of cellular products. The controversy surrounding whether cellular technology causes health problems "must be resolved before I give the technology to half a million salespeople," he said.

Also, "there are too many cellular black holes" where transmission gets disrupted for that technology to be viable, he said. "There is even a major Bell operating company that can't access its own cellular network from its own parking lot!"

On the other hand, Avon sees wireless as a way to reduce the cost of client/server computing. "Client/server is costing as much [as host-centric computing] because you spend all your time installing cable and maintaining the network," Perry said.

Meanwhile, Perry has outfitted 20,000 of his half-million worldwide sales reps with a handheld wired terminal that allows them to place orders on-line 24 hours a day; the device costs less than $100. He said the move has reduced the cost of an Avon order by about $1 — a significant amount considering that most orders generally total well under $20.

Perry said adding a wireless component to the terminal could enable Avon to slash printing costs by putting the half-million manuals it prints biweekly on-line.

For now, though, bandwidth, safety, convenience and other concerns are likely to plague users. Even Jim Barksdale, president of McCaw Cellular Communications, Inc., who described the virtual enterprise concept as "making people as effective outside of the office as they are inside," said he "wouldn't purport that such a capability is available today."

'And another thing. . .'

At last week's conference on wireless and mobile computing, The Hertz Corp., The Ryland Group, Inc., Marriott Corp., United Parcel Service, Inc. and other large companies expressed additional concerns about wireless technology:

- How do you coordinate billing when voice and data are being handed off among up to 60 cellular carriers nationwide? In UPS' case, the 50,000-truck company had the clout to get carriers to form one billing consortium to handle it. But that is not a likely scenario for the average company going wireless.
- There is still confusion among technology alternatives, and it was "like pulling teeth" to get vendors to help David Merritt, project leader at Hertz, grasp the technologies. "I still don't know that I have," he said.
- There are no internetwork service interoperability standards today; most users are closed in to one proprietary system. In addition, users are limited in their terminal equipment choices by the type of wireless network service they deploy.
- Battery life for portables is still restrictive, and it is illegal to use cellular technology on airplanes (though it reportedly works just fine).

—Joanie M. Wexler

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Local-area networking

DEC, Novell plan NetWare on Alpha

By Michele Dostert
BOSTON

Digital Equipment Corp. and Novell, Inc. plan to build a version of Novell's NetWare 4.0 local-area network operating system that will run natively on DEC's new line of servers based on the Alpha AXP 64-bit reduced instruction set computing (RISC) chip.

The NetWare for Alpha software developer's kits will ship by the end of the year, with actual products scheduled to be released in 1994. NetWare for Alpha will be sold both through Novell's reseller channel and directly by DEC's sales force.

DEC will face stiff competition in the NetWare-on-RISC market. The Novell/DEC agreement is similar to NetWare 4.0-on-RISC deals Novell has previously announced with Hewlett-Packard Co. and Sun Microsystems Computer Corp. for their Precision Architecture-RISC (PA-RISC) and Scalable Processor Architecture servers. HP's PA-RISC implementation is due out by the end of 1993.

One analyst pointed out that limitations of the NetWare operating system will prevent it from taking full advantage of the Alpha chip. "NetWare 4.0 addresses data in 32-bit chunks, not 64; Novell does not support the symmetric multiprocessing capabilities that are one of Alpha's main strengths, and it doesn't support the cluster architecture that lets Alpha scale so nicely," said Frank Dzubek, president of Communications Network Architects, Inc., a Washington, D.C., research firm.

On the fence

DEC users were divided on the new offering. "It's nice, but it's just a way for DEC to sell more Alpha boxes, and if it doesn't price those boxes very competitively, it won't even do that," said Bob Melford, a network symposium representative of the Digital Equipment Computer Users Society. "DEC would help their users more by teaching VMS to speak NetWare fluently — and natively."

"I think it's a great idea," countered Stephen Tihor, a research scientist at New York University who uses both Alpha boxes and NetWare. "Our Intel servers are running out of steam. I love these Alpha boxes, and I think you'll probably get some great I/O out of them as NetWare servers."

WordPerfect previews upgrades for DOS

By Michael Vizard
OREM, UTAH

WordPerfect Corp. will preview today the first major upgrade in 3½ years to its word processing software package. The new release will add what-you-see-is-what-you-get editing capabilities to the industry's most widely used PC word processing package.

WordPerfect 6.0 will also allow users to work in three different modes: a standard text mode, a graphics mode or a full-page mode. "The graphics mode is probably a little faster than the page mode because you don't see all the headers that you would see in the page mode," a company spokesman said.

The company will ship versions for Microsoft Corp.'s Windows and IBM's OS/2 by year's end, a spokesman said.

Other new features will include the ability to work with nine documents simultaneously. The current package allows users to work with only two documents at the same time. Version 6.0 will have fax capabilities and support for an UNDO command and will provide the ability to embed sound in documents.

WordPerfect 6.0, which is in beta testing, is slated to arrive this spring, shortly after WordPerfect delivers Version 5.2 of WordPerfect for DOS and OS/2. Version 5.2 is already available on Windows.

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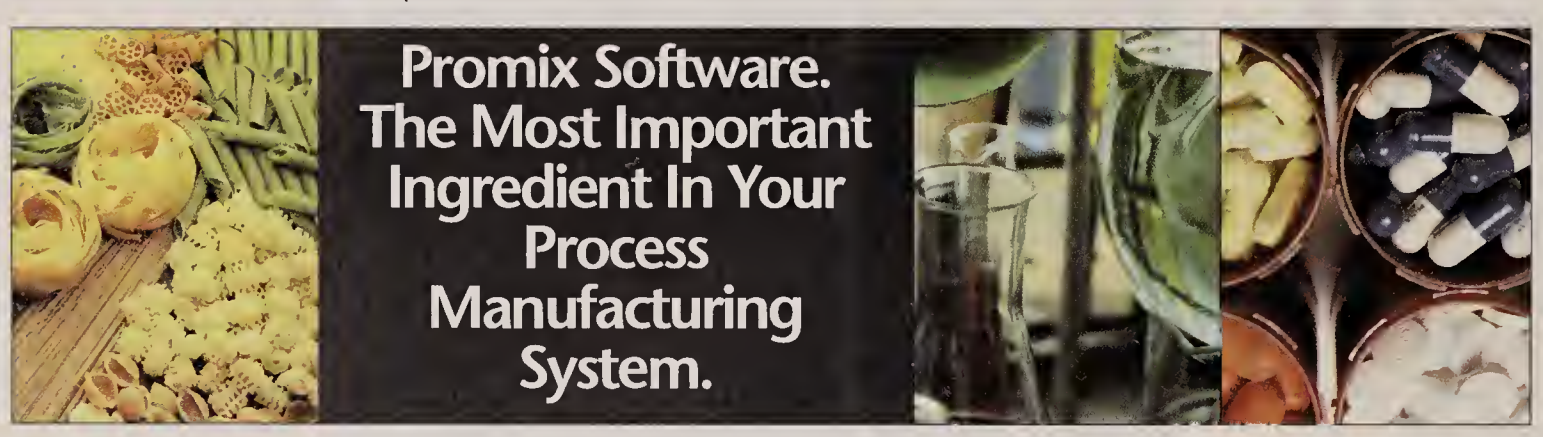

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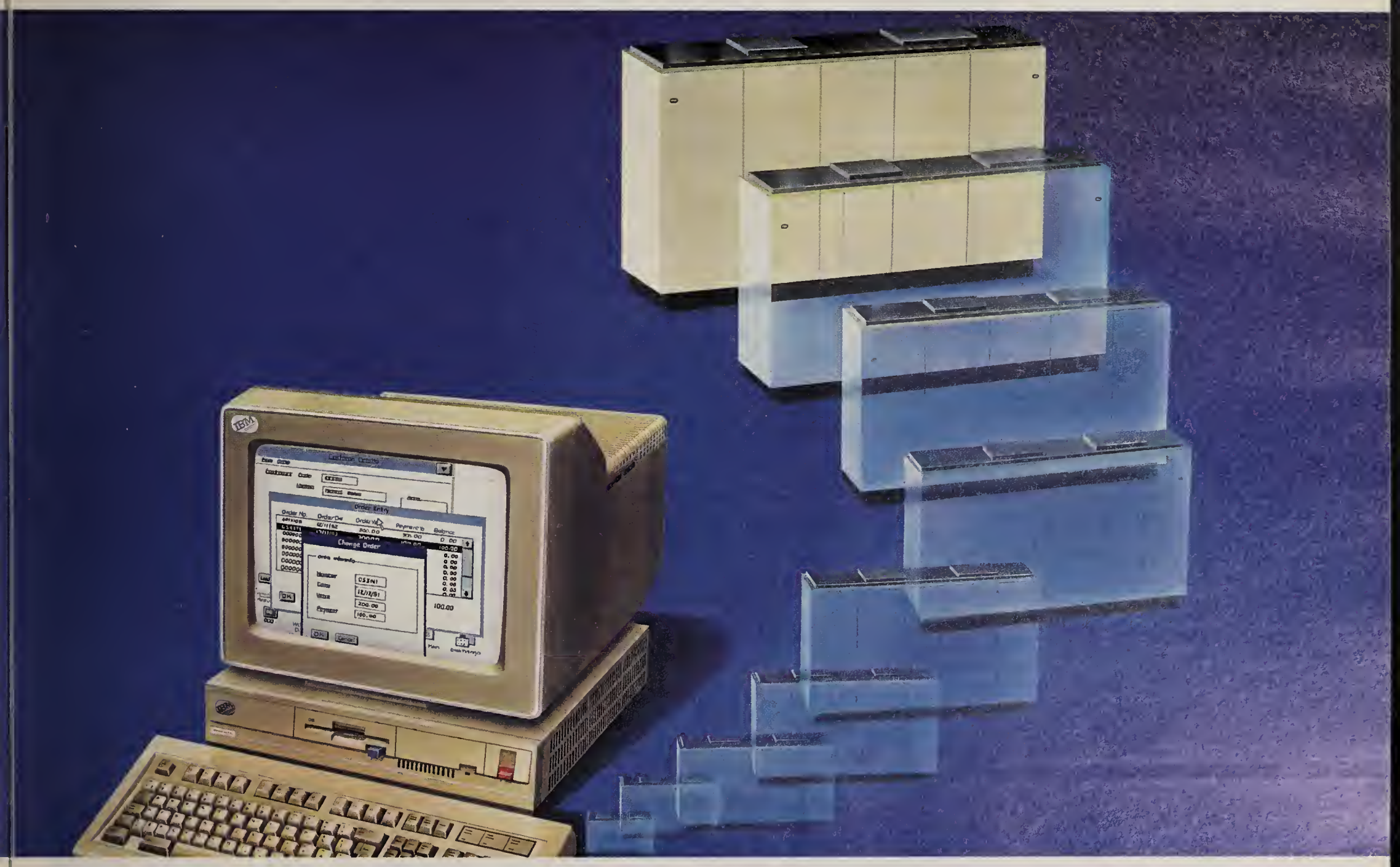

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IBM takes on Unix RDBMSs

DB2/6000 to aid re-engineering from legacy mainframes to client/server

By Jean S. Bozman
SAN FRANCISCO

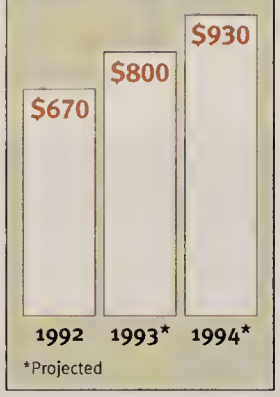
While IBM's Unix relational database for the IBM RISC System/6000 lacks some of the features of its database competitors, it gives IBM users a stepping-off point for migrating mainframe applications to open client/server applications, analysts said.

For longtime IBM shops, DB2/6000 provides a development database for the re-engineering of legacy applications. "It's not a heart-stopping, raise-the-flag kind of database," said Donald DePalma, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. But combined with IBM's new Distributed Database Connection Services/6000 (DDCS/6000) database query system, it can extract key data from IBM's DB2 mainframe database.

"It's a very low-cost, high-performance gateway to open systems," DePalma said. "This gives companies looking to replace their mainframes gradually a way out."

Opening up

IBM hopes to cash in on the Unix DBMS market, which is projected to grow at 20% this year



Source: International Data Corp.

David McGoveran, president of Alternative Technologies, agreed that DB2/6000 will appeal most to IBM users. "Even if the true Blue shop is disappearing, the people who ran those shops are not," he said. "Those people like to have a solution that lets them downsize without going away from IBM."

Lacking features

By comparison, DB2/6000 lacks triggers and stored procedures — two keys to event-driven, rules-based computing on database servers. However, IBM said stored procedures can be created by writing custom code. DB2/6000 also lacks binary large object (Blob) support for multimedia applications.

Technical differences between DB2/6000 and its Unix database competitors stem from its status as a first release, analysts said. Databases from Oracle Corp., Sybase, Inc., Informix Software, Inc., and The ASK Group, Inc. virtually matched on feature checklists last year.

Janet R. Perna, director of database technology at IBM Canada Ltd.'s Toronto software laboratory, directed development of the DB2/6000 database. She said her design goals were compatibility with IBM's DB2 relational database and speed. "We're prepared today to be competitive in terms of performance," she said.

But a number of new features will be released in the next 18 months. Among them: support for Blobs, variable-length fields, user-defined functions and user-defined data types and triggers, she said. DB2/6000 already has a cost-based optimizer and declarative referential integrity, which some rivals lack.

In announcing DB2/6000, IBM struck a number of technical partnerships with many of the major database vendors. Most of them have already agreed to support IBM's Distributed Relational Database Architecture standard, which will allow multiple databases to interoperate in distributed networks.

Late last week, Sybase and IBM disclosed a joint product development, marketing and support agreement.

IBM tries per-user pricing

CONTINUED FROM PAGE 1

to get into more applications."

The pricing announcement came as a relatively low-profile part of last week's barrage of database and Information Warehouse products (see story at right). In essence, IBM said, two of the three components of Version 3.2 of its mainframe Application Solution (AS) decision support software now include a per-user pricing option. Or users can choose the traditional tiered approach.

Prior to last week, each of the three mainframe AS pieces were priced according to the size — or tier — of the machine they ran on. Now the so-called "client" portion — a graphical user interface for terminals that actually runs on the host — and the business tools component, which includes statistics, project management, business modeling and other features, have a per-user price tag as well.

Savings plan

An IBM-provided example of the savings that can be realized with the new per-user pricing plan: A shop with a Group 70 processor with 200 end users, 10 of whom are using the optional statistics and project management portion, would pay a total of $6,116 per month vs. the old total of $8,610.

To keep track of how many users are on these modules, information systems shops would need to install another IBM software package: Software License Monitor, a free host-based package introduced in November 1992 to track the number of people using a mainframe application.

The third AS piece — the "server," which contains reporting, charting and other functions — still maintains the traditional tiered pricing approach, according to Shaun Jones, a market planner at IBM's Programming Systems laboratory in Warwick, England.

"This is the essential part of the system, and it is accessed by a lot of people. It would quickly get to the point where it is less expensive to pay the tiered price rather than the per-user price, so we thought it best to keep it on tiered pricing," he said.

Jones acknowledged that the per-user pricing move was made in part to compete with PC packages. "If our product is outrageously priced, no one's going to buy it, regardless of the function," Jones said.

He added that the new model will allow customers to pilot AS and grow from a small number without paying a heavy financial penalty.

Tom Aser, vice president of sales and marketing at IBM's Programming Systems headquarters in Somers, N.Y., said the model might spread to other IBM packages. "If this is successful, there might be other products we might consider." They would probably have "similar characteristics" to AS, he said. He pointed to applications such as OfficeVision where there is a buildup of end users over time.

"As utilization goes up, customers can make a decision whether to shift to [processor] group pricing or stay with per-user, whichever is most attractive," Aser said.

Another AS innovation that was implemented last year — breaking the host package into smaller pieces with functions that users can pick and choose — might also become more common, Azer said.

Stamp of approval

Most industry observers were upbeat about IBM changing its host software pricing and packaging structure.

"It's a very, very sane approach to things," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. "It should satisfy the comments of a large population of users, and it should actually reduce software costs."

This flexibility will be increasingly important, Dzubeck said, as the price of mainframe-class hardware drops. "If the mainframe costs $100,000, how can you pay $150,000 for a piece of software?"

Still, there is at least one flaw in the plan. Bill McNee, a vice president at Gartner Group, Inc. in Stamford, Conn., said, "IBM is providing different license managers on different platforms. The difficulty is in managing them all."

For example, McNee said, IBM has licensed Gradient Technologies, Inc.'s NetLS license manager for the RISC System/6000 platform. "I suggest IBM will most likely drop its proprietary solutions and adopt industry standards like NetLS for the mainframe," In about two years, McNee added, IBM will likely provide a metering approach.

Database doings

Among IBM's announcements last week were the following:

• **DB2/6000,** a relational database management system for the RISC System/6000, and Distributed Database Connection Services/6000, which allows customers to develop applications that access and update host databases from DOS, Windows, OS/2 and AIX workstations (see story above). Initial customer shipments of both products is slated for late July; general availability will be announced at a later time, IBM said.

Some 18 third-party vendors also announced packages that work with the new AIX database. Pricing for DB2/6000 ranges from $2,000 to $149,400, depending on the machine. For DDCS/6000, pricing ranges from $1,150 to $84,800.

• **Version 3.1 of DB2 for the mainframe,** which allows customers to distribute and update host-based data in multiple sites and improves query-processing time by up to 20%, IBM said. It is slated to ship by June; pricing ranges from $564 to $11,630, depending on the processor.

• **A decision support initiative.** IBM will work with third-party vendors, including Comshare, Inc., to bring together different decision support products in a common framework. IBM also announced Query/6000, a query-generation package for the RS/6000, and a new version of Query Management Facility VSE/ESA, which sports an improved end-user interface. Pricing was not available at press time. Pricing for Query/6000 depends on the number of users; for example, up to two costs $700, and more than 128 costs $30,000.

• **Data Propagator Version 2.1,** which allows bidirectional updating between IMS and DB2 databases. First customer shipments are due by late September; pricing and general availability have not been set.

• **IMS/ESA Version 4,** slated for late May. Enhancements include improved database availability, IBM said. Pricing ranges from $3,570 to $8,520, depending on the processor.

• **Information Warehouse architecture specifications** will be published next month.

— Johanna Ambrosio

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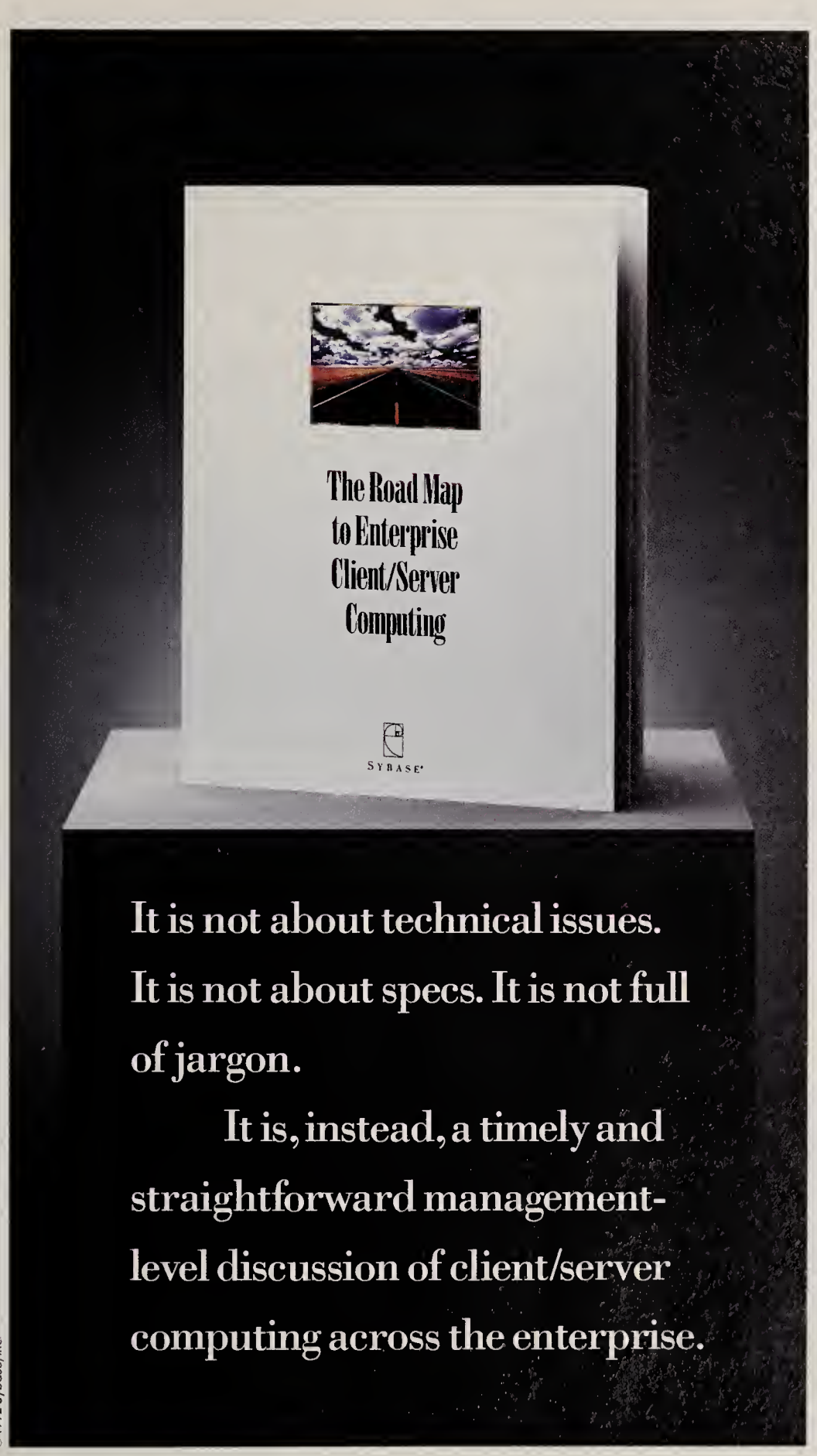

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Heat is on for client/server migration

By Maryfran Johnson
SAN FRANCISCO

Shortcomings in systems and network management, security and training are keeping information systems executives awake at night as they contemplate their shops' inevitable migration to open client/server computing.

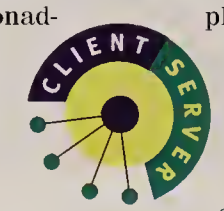
Solving those and other pressing problems occupied more than 100 managers from companies such as Shell Oil Co., Hyatt Hotels Corp., US West and JC Penney Co. at last week's first UniForum Technology Managers Conference here. On topics ranging from the high cost of retraining Cobol programmers to the gaps in industrial-strength software for Unix, the managers swapped war stories and heard advice from both peers and consultants.

"The big problems are not solved yet — things like configuration management, security or version control," said Judith Hurwitz, the conference organizer and president of Hurwitz Consulting Group in Newton, Mass.

Network topologies, for example, can cause major problems when one PC crashes and brings down the rest of the business "like a string of Christmas lights," said Gail Levesque, manager of special projects at Monadnock Paper Mills, Inc. in Bennington, N.H.

Monadnock Paper, the oldest continuously operating paper mill in the country, is migrating from customized software on proprietary Wang Laboratories, Inc. machines to open systems running packaged applications.

End users are playing a far more pivotal role in evolving client/server systems, she said, echoing the comments of other executives at the conference. The IS division at Monadnock is coping with a kind of role reversal as users help determine the business needs that will drive system purchases in the future.



Training essential

Personnel retraining and skill shifts were raised as sometimes overlooked costs in conversions.

"What I can guarantee doesn't work is sending your people off to a two-week class and then putting them onto new tools," said Ken Richmond, one of the conference speakers and senior technical lead at Charles Schwab & Co. in San Francisco. Instead, Richmond recommended more realistic expectations for a longer skill ramp-up time, plus better management at the top technical levels.

Some of the issues concerning open software development include difficulties moving applications from development to production platforms, a proliferation of tools offering only point solutions and the questionable expense of tools that do not become reusable assets.

At US West in Denver, for example, the telecommunications firm is standardizing on Hewlett-Packard Co.'s SoftBench computer-aided software engineering (CASE) tool framework, hoping to broaden its selection of "plug-and-play" tools from a variety of vendors rather than settling on one integrated CASE tool set. "We are in the driver's seat, selecting tools based on our needs, not the vendor's needs," said Terry Simmons, senior member of the technical staff at US West.

At American National Can Co., the route to open systems is leading the company toward a heterogeneous database architecture as it tries to reduce IS costs, halt its mainframe growth and give users more useful, transparent access to data.

The $4.5 billion multinational operates a complex network that serves more than 1,000 users on everything from 3270 terminals and HP Unix workstations to an Amdahl Corp. 5890-300E mainframe.

"There are a lot of products that do part of the job, and none that do it all," said Donald Brungard, vice president of MIS at American National Can.

Reality check

Top client/server challenges:

1. Lack of development and debugging tools.
2. Gaps in programmer skills and high retraining costs.
3. Incomplete methodology for defining architecture and application design.
4. Cost-justifying and budgeting.
5. Lack of available software for distributed systems and network management.
6. Integrating with legacy systems.
7. Personnel issues.

SOURCE: SURVEY OF 140 USERS AT UNIFORUM TECHNOLOGY MANAGERS CONFERENCE

Unix rivals unite

CONTINUED FROM PAGE 1

but we'll see," said Terry Barrett, district manager of Unix computing environments at Bell Communications Research in Piscataway, N.J.

Mark Schmidt, vice president of information technology and communications at Wal-Mart Stores, Inc. in Bentonville, Ark., said he sees the move as a positive — if somewhat overdue — one for the Unix industry.

"I think we got a wake-up call from our users and our software developers," said Ed Zander, president of SunSoft, Inc., a Sun Microsystems, Inc. software subsidiary that will now sell and support the Open Software Foundation's OSF/Motif.

"'Let's stop NT before anyone starts sipping the Kool-Aid. This is 75% of the Unix industry united," said Sun President Scott McNealy.

Some Sun users said they were concerned about moving to a new interface. "My users won't like it," noted Jon Tankersley, research scientist at Amoco Production Research in Tulsa, Okla. "But if the tools are customizable to the point we need them to be — we're an expert shop — we should be fine."

Sun's Scott McNealy: *'This is 75% of the Unix industry united'*

Notably absent from the party was Digital Equipment Corp., which has committed to running Windows NT as well as DEC/OSF/1 Unix and OpenVMS on its new Alpha machines. DEC officials were clearly miffed at the last-minute invitation they received just a few days before the announcement, and they said much of their "Unified Unix" strategy is already "fully compatible" with what the group is proposing.

"The more they actually follow up on this, the better off the Unix industry is going to be. We're not against them," said Bill Demmer, vice president of the computer systems group at DEC.

Mindful of Windows NT's expected impact on the desktop, some analysts said this effort may prove too little, too late for the fractured Unix industry — a suggestion rejected by IBM's Bill Filip, general manager of advanced workstations and systems. "We'd love to have Microsoft join us; then we could name our desktop APIs 'Win-Win,'" he quipped.

All the interfaces and technologies adopted under this effort will be turned over to the X/Open Co., a standards body that will brand and certify the products and then publish the full specifications.

"This is a long overdue triumph of the obvious," said Nina Lytton, an analyst and editor of the "Open Systems Advisor" newsletter. "Dawn has broken on marble heads."

Stressing that they are not a consortium or any kind of formal organization, the six companies plan to hold a developers' conference in October.

Products conforming to COSE are expected to ship in the first half of next year.

Analysts cautioned users that vendors are promising to support competing technologies — such as the OSF's Distributed Computing Environment and Sun's Open Network Computing-Plus — but not to make them interoperate.

"We don't think the decision to support three standards does anything to unify the Unix community at large; it just gets into a pick-and-choose options menu," noted Terry Smith, vice president of information systems at First Boston Corp. in New York.

Senior editor Elisabeth Horwitt contributed to this report.

Cozy, but comfy?

COSE spans six areas of technology: desktop user interface, networking, graphics, multimedia, objects and systems management.

Desktop: The Common Desktop Environment specification — to be published in June — will incorporate elements from HP's Visual User Environment, IBM's Common User Access model and Workplace Shell, SunSoft's OpenLook and DeskSet productivity tools, USL's Unix System V Release 4.2 Desktop Manager, the OSF's Motif tool kit and window manager (with modifications to support users familiar with OpenLook applications) and SunSoft's ToolTalk interapplication messaging facility.

The desktop environment will scale across a range of client/server platforms, providing a common look-and-feel "Unix dashboard" of capabilities such as electronic mail, text editing, productivity tools, window management, graphical object/file management and other features.

Networking: All six companies will sell, deliver and support the OSF's Distributed Computing Environment, SunSoft's ONC-Plus and Novell/Univel's NetWare Unix client networking products. Pricing and availability will be set later.

Graphics: All companies will support a set of graphics facilities from the MIT X Consortium.

Multimedia: The companies will submit a joint specification for the Interactive Multimedia Association's request for technology.

Object Technology: The companies will work together to accelerate development and delivery of object-based technology from the Object Management Group and will support the Common Object Request Broker standard for distributed object management.

Systems Management: The companies will form a working group to push acceptance of industry specifications. Initial focus will be on areas of user and group management; software installation and distribution management; software licensing management; storage management; and distributed file system management.

Lotus teases Notes for Unix

By Michael Vizard
SAN FRANCISCO

Lotus Development Corp. tantalized prospective customers last week at UniForum with a demonstration of Notes 3.0 running on Unix, while at the same time telling them that Notes will not arrive on Unix until at least midyear.

Lotus had originally promised to deliver a Unix version of Notes shortly after it delivers Version 3.0 on OS/2, which is scheduled to ship on April 1. Notes 3.0 debuts on Wednesday.

The delayed delivery of Notes on Unix was attributed to Lotus' efforts to debug the OS/2 version of Notes 3.0 before putting the product into beta testing on Unix, according to Terry Rogers, vice president of the Communications Products Division at Lotus.

Lotus' rollout schedule for Notes on Unix platforms could have a negative impact on a number of sites, including those looking to adopt multiprocessor servers for the groupware product, sites that do not wish to adopt OS/2 platforms simply to run Notes and government agencies that are required to run Unix, said David Marshak, an industry analyst at the Patricia Seybold Group in Boston.

"There is no competitive product to Notes, so I don't think Lotus will lose any customers over this, but it will delay the delivery of large-scale Notes applications," Marshak said.

"In general, Notes 3.0 is late," said Priscilla Emery, a vice president at New Science Associates, Inc. in Westport, Conn. "With Notes 3.0 and Unix support, customers are looking at Notes as an enterprisewide collaborative environment. It's not just a workgroup novelty anymore."

The major components of Notes 3.0 that will arrive next month include support for Apple Computer, Inc. Macintosh clients, a text-retrieval engine based on technology supplied by Verity, Inc., support for a broad range of network protocols, an enhanced Microsoft Corp. Windows interface, a hierarchical naming service, a richer set of application development tools, support for basic workflow and version control functions and an enhanced mail-routing capability.

The Unix version of Notes is scheduled to go into beta testing next month. The first operating systems supported will be Sun Microsystems, Inc.'s Solaris, followed by The Santa Cruz Operation's SCO Unix, Hewlett-Packard Co.'s HP/UX and IBM's AIX, said Tony Parham, product manager for Unix products at Lotus.

Above and Beyond

Coinciding with the rollout of Lotus' Notes 3.0., Beyond, Inc. will introduce two new electronic-mail products that work with Notes.

Beyond Notes Connection [CW, Oct. 12, 1992] is a lower cost method for Beyond Mail users to participate in Notes database discussions because it does not require a Notes license. Scheduled to ship next month, it will cost $995 for an installation supporting 50 to 100 users. Notes lists for $495 per node.

For Notes users, the company will ship a version of Beyond Mail for Windows that can be used as an alternate mail option from within Notes. Because Beyond Mail works with Novell, Inc.'s NetWare Global Message Handling Service and Banyan Systems, Inc.'s Vines, this gives Notes users, for example, access to the Vines StreetTalk directory. —*Lynda Radosevich*

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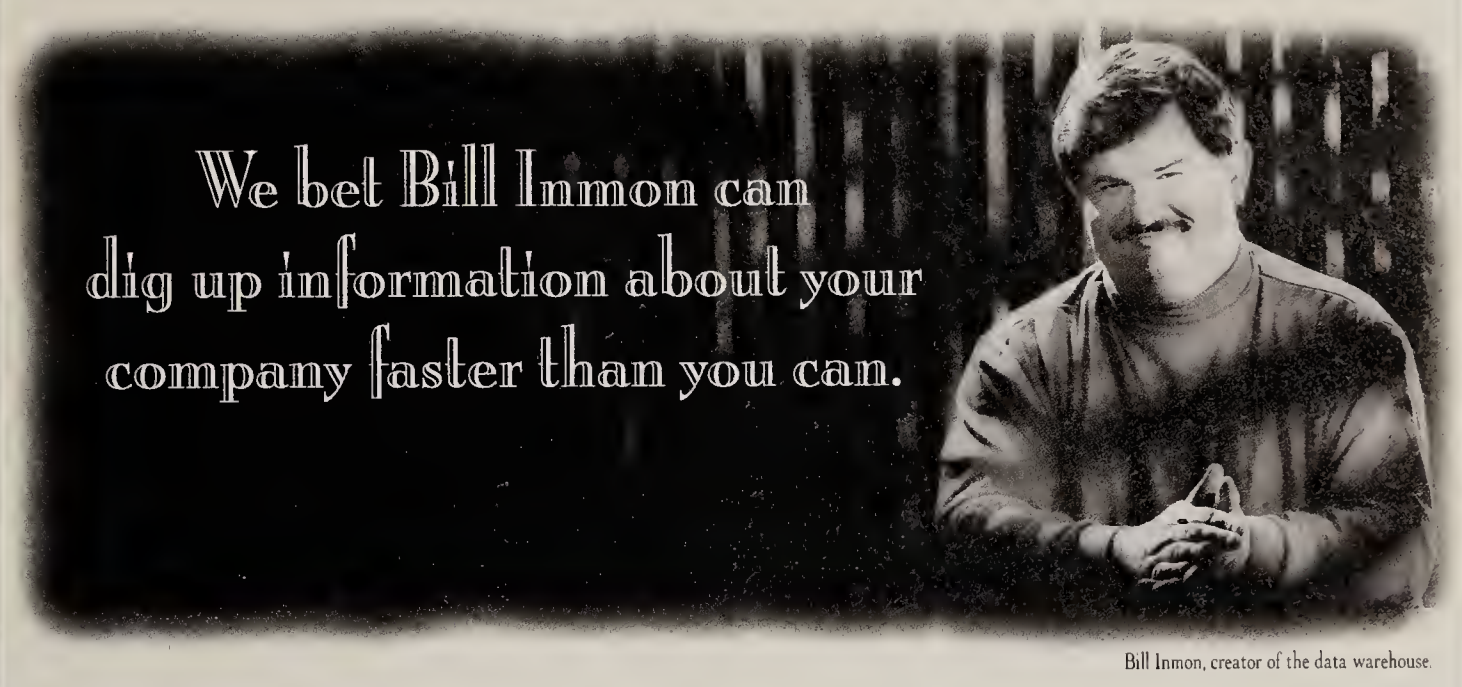

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News Shorts

Privacy group hails BBS ruling

The **Electronic Frontier Foundation**, based in Washington, D.C., hailed a March 12 court ruling in the case of Steve Jackson Games v. the U.S. Secret Service as a victory for the constitutional rights of electronic publishers and computer bulletin boards. A federal judge in Austin, Texas, ruled that the bulletin board operator's First Amendment and privacy rights were violated when the Secret Service seized his system as part of a hacker investigation.

Adaptive reabsorbed by parent NET

Following an agreement to merge earlier this month, broadband switch company **Adaptive Corp.** and its parent **Network Equipment Technologies, Inc.** (NET) detailed reorganization plans last week. Adaptive, which will focus on Asynchronous Transfer Mode and frame-relay switching products, will become one of three NET divisions. They include the T1 multiplexer-oriented Network Systems Division and a newly formed Transmission Products Division, which will assume responsibility for Adaptive's Sonet Transmission Manager and SPX statistical multiplexer.

HP chooses Unix mini manager

After a protracted search, **Hewlett-Packard Co.** last week filled the job of general manager for its Unix minicomputer operations, known as the General Systems Division. The firm tapped Carol Mills, who had been general manager of HP's client/server group. As head of HP 9000 operations effective April 15, Mills takes over a division that is growing at a roughly 40% clip and that is believed to now account for more than half of HP's minicomputer sales. Mills replaces Bernard Guidon, who will serve as European marketing manager for all HP minicomputers and workstations.

Andersen reveals financial details

Andersen Consulting is loosening up on information. The firm last week held a daylong briefing, the first of its kind for the Chicago-based consultancy. While Andersen remains mum about its earnings, it recently published an annual report indicating that its firmwide revenue for 1992 was $2.72 billion, up 16% from 1991. Significantly, Andersen claims 40% of its business last year was related to the design, development and support of client/server systems. Andersen officials said last week they expect to reach nearly $2 billion in client/server-related business this year.

Hitachi boosts mainframe line

Hitachi Data Systems Corp. announced it will ship 13 new models of its IBM-compatible GX mainframe line by year's end. This brings the total GX lineup to 26 mainframes, including a 390 million-instructions-per-second, eight-processor machine. However, HDS did not provide final prices or say when it would ship new IBM Enterprise System/9000 features.

SHORT TAKES **Digital Equipment Corp.** announced Pathworks ISDN (DOS), which is said to enable PCs connected to DEC Pathworks servers to communicate over Integrated Services Digital Network Basic Rate Interfaee connections.... **AT&T** last week said it will extend its frame-relay service to Canada and nine European countries in July, bringing its European eovcrage to 16 countries.... **The ASK Group, Inc.**'s Man-Man/X manufacturing program has been ported to the HP 3000 with **PeopleSoft, Inc.**'s financial and asset management software due to follow later this year.... PeopleSoft also plans to introduce versions of its financial and human resource paekages for **IBM**'s DB2 AIX/6000 and DB2 OS/2 databases, which were announced in January.

Hyatt ups open systems

CONTINUED FROM PAGE 1

most immediate need for more computing power stems from a pending change in its internal reservation process that will more than double the number of annual reservations handled by central computing operations from roughly 2.5 million to 6 million, according to Kerr.

Hyatt will soon tie into the system the reservations that its 105 U.S. hotels book directly. Hyatt will also add direct bookings from about 10 of its 64 overseas hotels, Kerr said. Hyatt's Transmission Control Protocol/Internet Protocol network runs over fractional T1 lines in the U.S. and through X.25 dial-in lines from the overseas hotels.

The direct reservations are handled by smaller AT&T 7000 servers at each hotel. Hyatt has used the central system for toll-free phone and travel agent bookings and will continue to use it for those functions.

Many of the hotel-direct bookings are for groups rather than individuals, so the 140% increase in reservation volume will not translate into a 140% increase in processing activity because each group is processed much like an individual would be, Kerr said.

Processor predicament

Still, the change will increase processing demands by 50% to 100% — enough to merit a new system. And while the company is leaning toward a 24-processor Pyramid system, it has not yet made its final choice, Kerr said.

Kerr noted that benchmark comparisons by the Transaction Processing Performance Council show little meaningful difference between Pyramid and HP machines but a wide gulf between those two and the less powerful NCR 3550.

All things being equal, Kerr said, it would make good business sense for Hyatt to buy a Pyramid machine because Pyramid has a proven performance record at Hyatt with the AT&T 7000.

Similarly, he noted that HP lacks experience in symmetric multiprocessing (SMP). HP has been in that business since late 1991, while Pyramid has practiced SMP for years.

HP Computer Systems Organization Vice President Wim Roelandts pointed out that HP's system runs on four processors, while Pyramid's requires 24. When transaction processing machines shift into batch jobs, they switch to a uniprocessor mode, in which case the stronger HP processors would vastly outperform the Pyramid processors, he noted.

"One pony is worse than one big horse," Roelandts said.

Kerr agreed with that assessment but said Hyatt "does not have that many batch operations."

Hardware equation

And while both Pyramid and HP outperform the NCR machine, Kerr claimed that NCR — an AT&T subsidiary — is still in the running because remaining with the same supplier affords Hyatt business continuity.

Another factor is system availability. Kerr said Hyatt will start adding hotel-direct bookings to the system on May 1 and hopes to make its hardware decision by May 15, if not sooner.

"If someone says, 'You can have it in October,' then they're out of the question," Kerr said.

Room service

The collapse of the Confirm reservation project, which was to have provided systems and processing to the travel industry, has opened up possibilities for Hyatt to market its in-house-developed system to other lodging concerns, noted Gordon Kerr, Hyatt's senior vice president of MIS.

Hyatt is talking with prospects whom Kerr declined to identify. "Confirm tied the industry up for a long time," he observed.

The Confirm development consortium, known as Intrico and headed by AMR, fell apart last summer amid charges that AMR had deceived partners Hilton Hotels, Marriott Corp. and Budget Rent A Car Corp. into continuing to invest in a troubled operation [CW, Oct. 12, 1992].

Hyatt plans to offer outsourcing on its own or through a third party and is also trying to license its software to hotels that would make their own processing arrangements, Kerr said.

Hyatt may work with a third party to overcome concerns among hotels worried about relying on a competitor to supply information technology.

Kerr said the lodging industry will eventually come around. "Does it make sense for 10 hotels to each run a different reservation system? I don't think so," he observed.

—Mark Halper

Mead Data shuns host for Unix system

By Mark Halper
DAYTON, OHIO

Likening the challenge to "changing spark plugs on a truck going down the road at 60 miles per hour," Mead Data Central, Inc. last week said it is migrating its computer operations from a mainframe environment to Unix platforms provided by three vendors.

Mead Data, which markets the Lexis and Nexis legal and news information services, is shifting to Hewlett-Packard Co., Sun Microsystems, Inc. and NCR Corp. gear. It had been using IBM, Hitachi Data Systems Corp. and Amdahl Corp. iron.

The massive undertaking entails moving some 2T bytes of information off eight mainframes, said Claymon Cipione, Mead Data's vice president of production, development and operations.

The company is making the switch to cut costs and decentralize computing operations, Cipione said. "Glass houses are like things that glow in the dark," he said. "Tornados find them; airplanes erash into them."

He declined to quantify estimated savings.

Cipione said the cutover will affect all of Mead Data's operations, including its fabrication unit, which puts the data the company gathers "from almost every vehicle known short of word of mouth" into Mead Data format.

The eompany's electronic sources include news wires, the Internet, magnetic tapes and paper scanners.

Mead Data has already taken delivery of an HP 9000 Corporate Business System, HP's mainframe-class symmetrical multiprocessing minicomputer, and is believed to be negotiating the purchase of two additional Corporate Business Systems to provide redundancy.

The company has also purchased Sun 690s and NCR 3445, 3450 and 3550 boxes, Cipione said.

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WilTel to offer ATM-based net service

Public channel-extension network aimed at firms consolidating data centers

By Joanie M. Wexler
THE WOODLANDS, TEXAS

Long-distance telecommunications carrier WilTel plans to announce today what analysts said is the first application-driven Asynchronous Transfer Mode (ATM) offering: a public channel-extension network service.

WilTel said the service is aimed at companies consolidating data centers and needing high-speed connectivity between distributed, high-performance peripherals and centralized hosts.

However, some users immersed in data center consolidation, such as WilTel customer Atlantic-Richfield Co. (Arco) in Los Angeles, said they do not need more bandwidth.

John F. Coman, Arco's manager of networks and information services, said, "If you do data center consolidation, you need less channel extension afterwards." One reason for this, he said, is that "everyone is getting away from high-speed printers because there is a tremendous drive to reduce paper."

Companies that do wish to extend the lightning-fast speeds of point-to-point channel network jaunts over wide geographic areas will require broadband networks, however. WilTel's channel-extension service will initially roll out over a T3 (45M bit/sec.) network this month and shift to a full-blown ATM-based offering in the fourth quarter.

Joining in
AT&T and Sprint Corp. have announced they will have ATM networks in place this year, though they have not defined what kinds of services will be available. MCI Communications Corp. identified channel extension as a targeted application with its switched T3 service, though it offers no end-to-end channel-extension service yet.

ATM is an emerging technology that can eventually take users into gigabit networking. It suits the intermittent nature of channel traffic because users pay for network services only when they use them.

WilTel is building its network on equipment from channel market leaders Computer Network Technology Corp. and Network Systems Corp. so users of these vendors' products can blend their private and public channel networks, said Bill Wilson, WilTel's vice president of strategic planning.

The point of a public service is to give users high-speed channel networks without their having to make hefty capital investments (for example, Computer Network Technology equipment runs from $30,000 to $100,000-plus at each end) and to spare them from the higher costs of buying other devices and communications links piecemeal, he said.

Wilson would not provide specific WilTel pricing structures other than to state that monthly costs could range from $15,000 for a "very simple, single-link, point-to-point connection" to $200,000.

However, Berge Ayvazian, a senior vice president at The Yankee Group, a Boston consulting firm, said WilTel's aggregate purchasing volume will allow it to package channel-extension gear "more economically than any individual customer. Users would probably pay 10% to 20% more" for equipment if they were building a private channel network.

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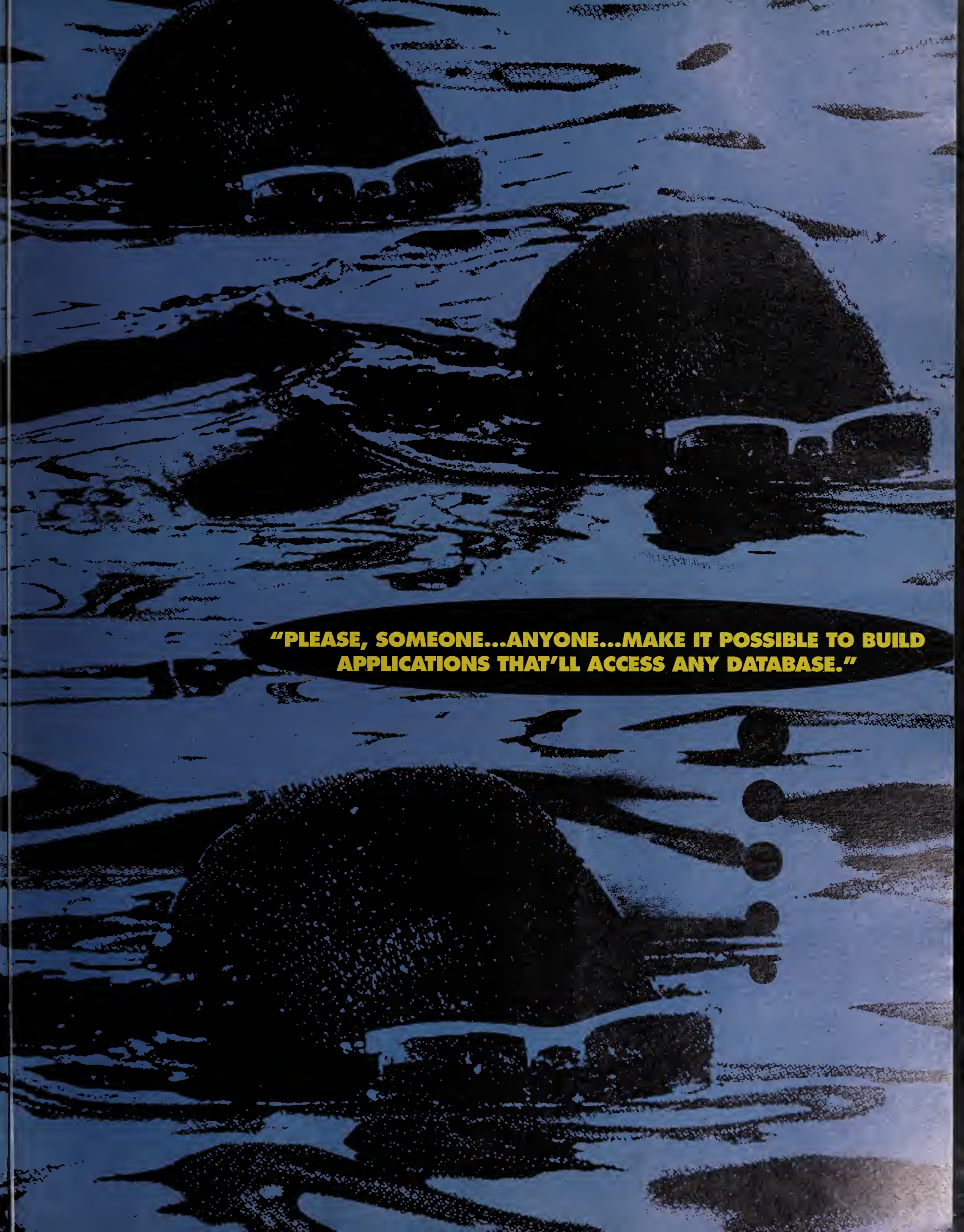
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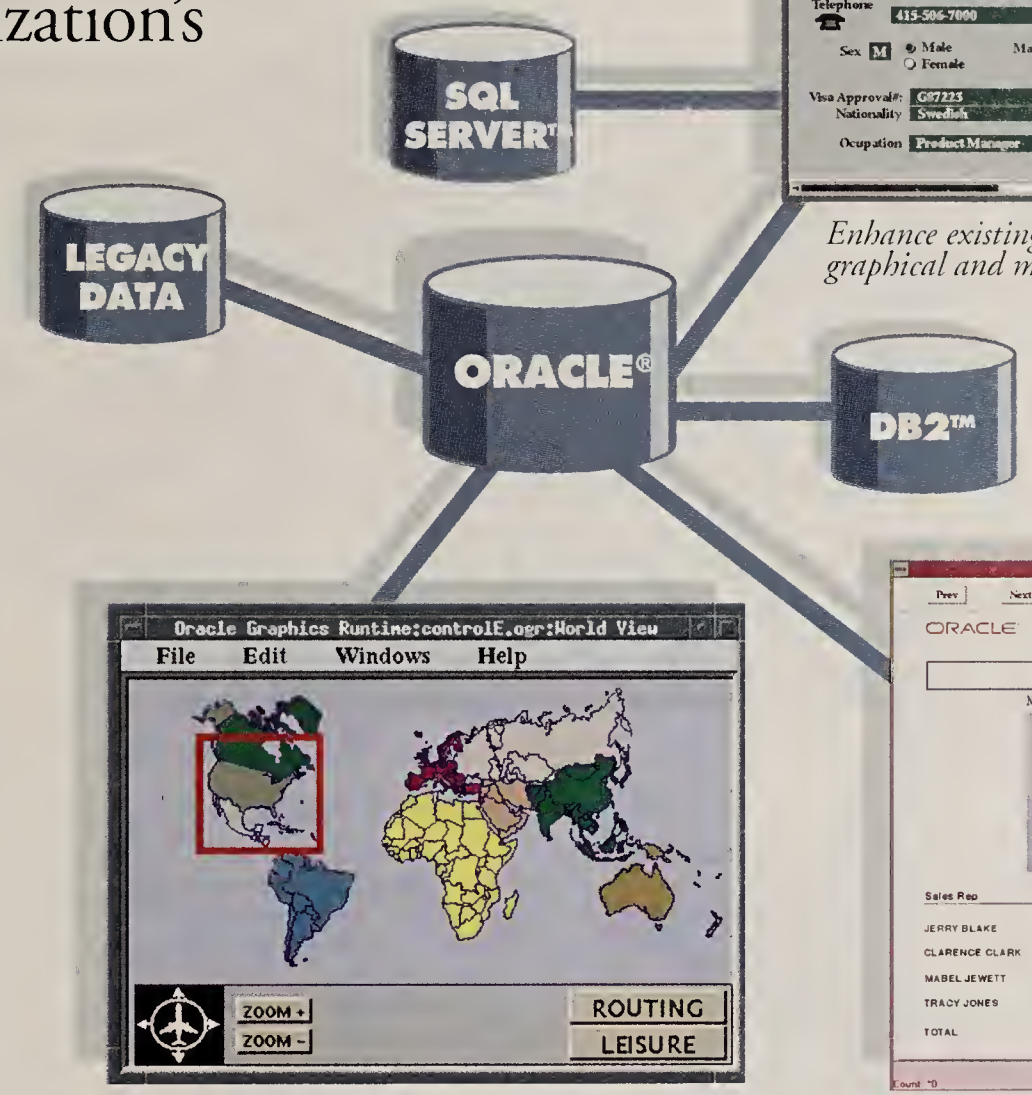

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ORACLE

Wide-area networking

SNMP to manage long lines

By Elisabeth Horwitt

Leading carriers are finally climbing off their proprietary or Open Systems Interconnect-based network management platforms and offering to make their broadband services manageable by Simple Network Management Protocol (SNMP).

This will be a real boon to users who increasingly want one SNMP-based system to manage an end-to-end, local-area network-to-LAN connection — including the carrier "cloud" in the middle, according to Iain Stevenson, senior consultant at London-based research company Ovum Ltd.

Next week BT is expected to announce that it will provide SNMP manageability for its Global Network Services (GNS) by year's end. This will "enable users on the LAN end to see the status of [BT's] LAN Interconnect Service: whether a circuit is up or down, as well as traffic levels," said Keith Willetts, group development executive for BT's managed communications services.

BT's announcement closely follows a similar introduction by MCI Communications Corp.

Schindler Informatik AG is one company looking for an SNMP management system for a global installation of LANs that it is in the process of connecting via Integrated Services Digital Network, according to Ed Hodgson, manager of computing and communications at the Swiss elevator company. A direct tie-in to the carrier via SNMP would be useful if it supplied real-time information about a network failure and what the carrier is doing about it, Hodgson said.

BT is also expected next week to announce alliances with Hewlett-Packard Co. and Sun Microsystems, Inc.'s SunConnect unit to "tightly integrate" BT's Concert network management system with the two vendors' SNMP-based network management systems.

The companies will link and synchronize Concert's database with those of the SNMP systems, with the goal of giving SunNet Manager and OpenView users fuller management of BT's GNS, Willetts said.

This second phase of BT's SNMP support is scheduled to deliver the following functions by its first-quarter 1994 rollout: on-line, on-demand provisioning of bandwidth on BT circuits; two-way alert exchange between user and carrier; on-line access to carrier billing information; and on-line ordering of BT services.

At the recent Interop '93 Spring show, MCI introduced a management information base that will enable SNMP systems to monitor circuits on MCI's HyperStream family of broadband services. MCI also announced HyperScope, a SunNet Manager-based turnkey system for managing HyperStream frame-relay services both here and overseas. The system is available now for $965 per month.

MCI will support SNMP management of HyperStream Switched Multimegabit Data Service by summer, the company said. Sprint Corp. plans to provide general availability of SNMP-based management of its frame-relay service by year's end, a company spokesman said. It is looking at expanding SNMP management capabilities to its X.25, private-line and ATM services as well.

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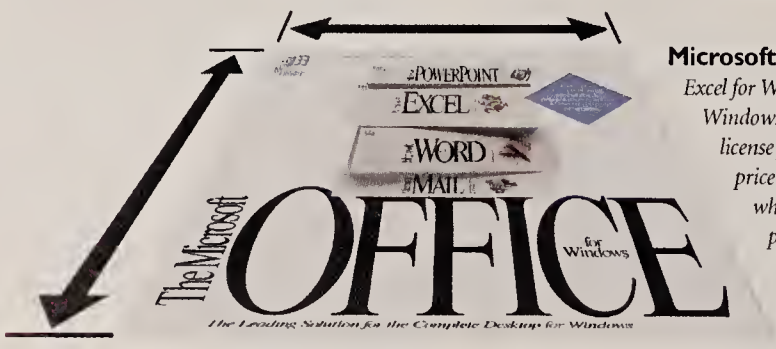

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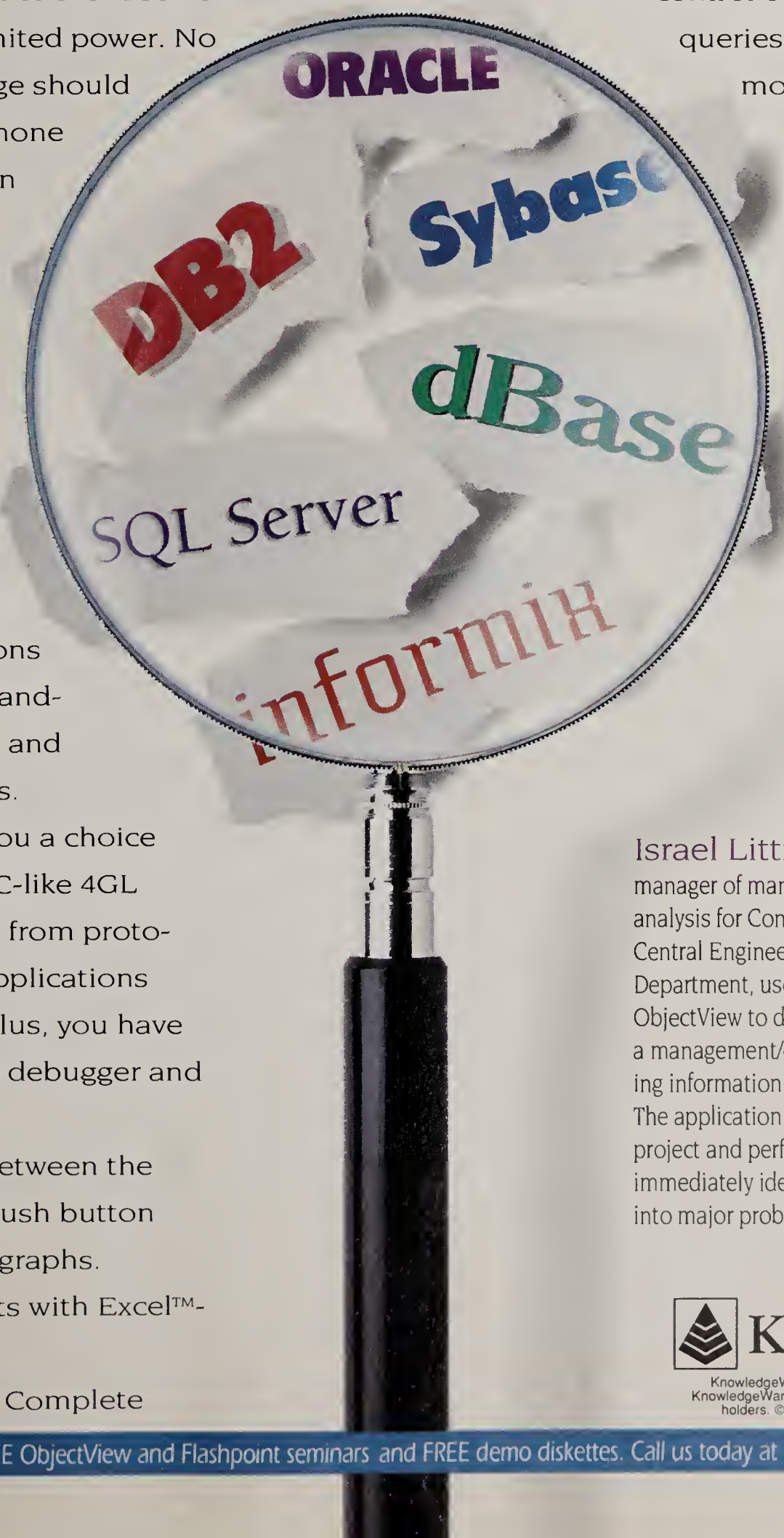

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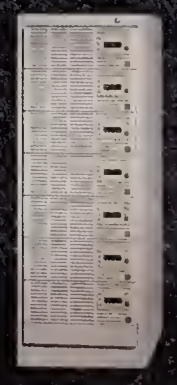

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It's TV time

HDTV may be on hold, but a personal movie theater box is still in the offing

By Kim S. Nash

The television of the not-so-distant future promises more than a technopolitical battle over HDTV.

Picture a voice-controlled appliance with a PC's smarts and the audiovisual quality of a movie screen whose information and entertainment broadcasts you tailor. Now picture it in time for Christmas.

EYE on the FUTURE

The Federal Communications Commission's February decision to delay choosing a standard for high-definition television (HDTV) from among the four submitted last year opened a window of opportunity for computer and cable companies to beat HDTV players to market with advanced digital TV technologies.

Ditching current analog TV broadcasts for digital transmissions — and installing supporting technologies such as fiber-optic networks — will happen in stages and not without struggles. But once it arrives, digital technology will lay the groundwork for interactive, whizbang television and true multimedia PC applications.

Superappliance

PC and TV technologies will converge, resulting in a single, super household appliance that handles all functions now performed by the separate boxes — and more. "Your TV is likely to have an Apple or IBM logo on it five years from now," said Nicholas Negroponte, director of MIT's Media Laboratory in Cambridge, Mass.

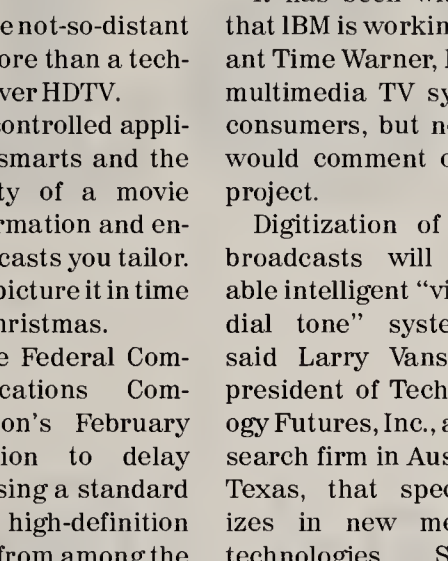
Marrying PCs and TVs will require something old, something new and something Blue, if IBM has anything to say about it. Existing technologies such as digital communications networks and fiber-optic cable will have to work with tools still in development, including heavy-duty data compression systems. IBM maintains that mainframes are perfect as servers for compressed images as well as full-motion video.

It has been widely speculated that IBM is working with media giant Time Warner, Inc. to develop a multimedia TV system for home consumers, but neither company would comment on the rumored project.

Digitization of TV broadcasts will enable intelligent "video dial tone" systems, said Larry Vanston, president of Technology Futures, Inc., a research firm in Austin, Texas, that specializes in new media technologies. Such systems go beyond today's pay-per-view scheme, where a viewer calls his cable company to sign up for a movie that the company has scheduled to broadcast on one of its for-fee channels.

Personal channels

In video dial tone, a viewer uses a remote control to program his digital TV (or, in the interim, a digital converter box) to capture and download one of a large selection of movies to his personal channel. When the show ends, the viewer can download information from a shopping network to do the grocery shopping or order Chinese take-out from the corner restaurant.



Source: Technology Futures, Inc.

This sort of "information on demand" is not that far off. About 200,000 digital satellite receivers from Hughes Network Systems are projected to hit retail stores by December, with initial digital transmissions — largely entertainment — scheduled for broadcast in early 1994.

It's too soon to estimate what this couch potato nirvana will ultimately cost the average viewer. But experts bet that we will share in the cost of outfitting cable companies with fiber-optic networks and other equipment, a task estimated at $5 billion to $15 billion.

Moreover, for all this to come into focus, cable, computer and TV companies will have to cooperate.

CHIP SIMONS

Fat chance, said skeptics such as Dwight Allen, senior manager for the telecommunications and electronic services industry program at Deloitte & Touche's Washington, D.C., office.

Negroponte agreed. "The entertainment market is just huge," he said, adding that home entertainment companies are pushing harder than business-oriented computer companies to get digital technology devices onto store shelves. Consider that the electronic book publishing industry pulled down $100 billion in worldwide revenue last year and that video movie rentals totaled $12 billion in the U.S. alone.

Little guidance

Meanwhile, governmental efforts to guide the development of TV technologies before private companies fly off in their own directions has been slow going, at best, Allen said.

The FCC, for example, has been making noise about choosing an HDTV standard for some time, and still no decision has been made. Plus, an already slow-moving FCC was made slower by the recent White House administration changeover.

By the time the FCC even looks at the HDTV submissions again, there will be digital products on the market, Negroponte noted. "Nobody's daydreaming in this area," he said.

Even so, intra-industry battles could slow progress. Both cable and phone companies are vying for future consumer business by laying down fiber-optic backbones.

Right now, phone companies supply individual, low-bandwidth channels to each home. Cable companies, by contrast, control a smaller number of higher bandwidth channels shared by many homes in a given geographical region.

To achieve the digital vision, cable companies want to use data compression and fiber optics to bring separate channels to homes via large multiplexers. Phone companies want to find a way to add more bandwidth to each of their individual lines.

Computer vendors will shape the digital evolution, but not for a few years, Negroponte concluded. Rather, PC software and hardware makers such as Microsoft Corp. and Apple Computer, Inc. will gradually increase the capabilities of multimedia machines, which will become the de facto TVs of the future.

"The entertainers will have to come around eventually and work with computer companies if they really want advanced technology in their products," Negroponte said.

HDTV time frame

February 1993 — FCC adds minimum criteria to list of HDTV standard requirements, sending the four teams who submitted proposals back to the drawing board.

1995 — Initial HDTV transmissions go out to the general public.

2008 — HDTV is the only television signal broadcast.

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Editorial

Thanks, Microsoft

As I sit writing this editorial on the big Unix collaborative announcement of last week, it seems appropriate that I chose a yellow underliner to highlight certain selections of my notes. That's because you can't help feeling a little jaundiced when yet another group of vendors has banded together to "do the right thing" for users.

Even the most jaded observer, however, has to be excited about the first real prospect of unifying the many diverse flavors of Unix into a blend of greater consistency. The result for customers, if all goes according to promise, would be a tremendous increase in the compatibility of Unix software across disparate hardware platforms. No, not one Unix, but at least a common set of application interfaces. And that is truly good news.

One vendor in the Unix unification group, Sun, has an excellent track record of making development alliances work, given its experience working with AT&T in the Unix International group. That group was successful because it carefully defined its goals and limited its size — characteristics of the current group of collaborators.

With all the potential benefit for customers from this confederation, the motives for its organization shouldn't really matter. But they do matter and, to that end, Unix aficionados ought to sit down and write a thank you letter to Bill Gates and Microsoft.

Thank them for being big. Thank them for being aggressive. Thank them for being hated. Thank them for being the IBM of the 1990s. And thank them for scaring the pants off a group of vendors that otherwise might not have joined ranks to, in their words, respond "to increased customer demand for consistent technologies across multiple platforms."

Be glad that the Federal Trade Commission didn't issue the harsh sanctions against Microsoft that some members of the new Unix consortium so ardently sought. The investigation alone should be enough to force Microsoft to stay within the boundaries of competitive fair play, as painstakingly defined in the voluminous U.S. antitrust laws.

But there are no laws against playing hard. In a free market, hardball only forces others to elevate their own performance. That's what's happening here.

If the Unix group delivers as promised, the pressure will be on Microsoft to deliver a version of its Windows NT operating system that similarly answers the customer requirement for cross-platform compatibility. And with some 2 million copies of another NT competitor, namely OS/2, already in users' hands, Microsoft will have no choice: It must make NT all it's been cracked up to be.

Bill Laberis

Bill Laberis, *Editor in chief*

Letters to the editor

IS must meet business needs

The Feb. 15 issue contains two pieces touching on the place of information systems in the organization.

Rick Marshall's Viewpoint article "Don't let IS become your CEO's ball and chain" offers a view of IS as a cost of doing business. In his In Depth article "Performance anxiety," Dan Allen discusses the need to audit and analyze IS performance, with attention to structure, discipline and control.

While these perspectives are very important, they overlook the most significant factor influencing the IS department — the contribution to the mission of the organization.

Sophisticated systems, cost savings, thorough outsourcing and high scores against industry benchmarks make for good conversation in the IS clubhouse. Yet, IS is a service unit just like personnel, purchasing, accounting and a variety of other departments. And, just like those other departments, the importance of IS comes from what it does for the success of the organization.

Mr. Allen teases us with an opening dialog that ends with no response to a crucial organizational need.

That single response, or its absence, says more about IS than the sum of all the audits, analyses and cost reductions.

Computerworld could do its readers a great service by increasing attention to this less quantifiable area.

Forrest E. Stanley
Bakersfield, Calif.

Pass or fail

Regarding Paul Gillin's commentary "OS/2 — no jokes" [CW, Feb. 15], I wish to thank Mr. Gillin for letting us know that OS/2 "requires that the user understand concepts such as what a DLL file does or the difference between startable and installable partitions."

Upon learning this, I immediately told my 16-year-old daughter that she would have to stop using OS/2 until she learned all about DLLs and installable partitions.

If Paul Gillin says it's "required" then, by gosh, it's required. I shudder at the thought of all those OS/2 users out there like my daughter who are proceeding ahead with no knowledge of these critical concepts.

Anyway, thanks to Mr. Gillin, no one in my household will use OS/2 until he can pass a rigorous OS/2 test.

William Keegan
Bedford, N.H.

Forgot ODBMS

Scott Koehler's commentary "The scoop on OOP" [CW, Feb. 8] provided a brief and thoughtful overview of two of the three main areas of object technology: tools and languages.

I was, however, quite surprised to see that he omitted any discussion of object database management systems (ODBMS) — the third leg supporting any object-oriented application development platform.

Object technology is about more than just graphical user interfaces (GUI) and languages. It's a new way to build applications that requires retooling not only the GUI and language but also the database management system underneath it.

I suppose he'd reply: "OOPS, well two out of three ain't bad."

David A. Kellogg
Menlo Park, Calif.

Playing favorites

I am starting to feel that *Computerworld* has been placed on Microsoft's payroll or has become naive enough to believe Bill Gates' lies. Michael Vizard's article "Client/server caveats" [CW, Feb. 15] was not much more than a plug for Windows NT.

He criticizes OS/2 for being too large and unwieldy. Yet, if Vizard had used OS/2, he would readily recognize how easy and intuitive it is to use. More importantly, Windows NT is much larger and unwieldy.

I guess that IBM bashing and biased reporting are now accepted and popular at the *Computerworld Star*. Hope to read the "Windows NT interfaces with aliens" article next issue.

James Villela
Torrance, Calif.

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The IS spouse strikes again

Alice Lesch Kelly

When my husband and I decided to buy a house, we were both filled with excitement thinking of the many home improvements we could make.

"We can paint the dining room pale blue and buy an oriental rug!" I said. "We can rip down all the kitchen cabinets and replace them with a new set of oak cabinets!"

"And we can wire the entire house with coaxial cable, buy a few more PCs and some LAN software and E-mail each other from room to room!" Dave said. "Just think of how it will add to the house's resale value!"

Uh oh. The IS spouse strikes again.

Dave and I both have big plans for this house, but I'm afraid we may be at odds. Take the spare bedroom. I think it would be nice as a den. We could put up some bookshelves, have a comfortable reading chair and maybe even buy an antique desk. And a window seat would look wonderful.

But Dave has other ideas.

"This," Dave said when he saw the spare bedroom, "will be the systems room."

I can envision the compromise: an antique desk hidden by a PC and a scanner, bookshelves sagging under the weight of too many copies of Borland C++ documentation and an easy chair surrounded by the many computer publications that our poor mail carrier lugs to our front door each day. And the window seat would be a perfect place for the laser printer.

PETER SPACEK

To the penny

Of course, there are some advantages to having an IS spouse while buying and decorating a house.

For example, when it came time to negotiate, Dave was able to use his many spreadsheet programs to figure out exactly — and I mean exactly — how much everything would cost us.

"If the bank lowers its interest rate tomorrow by .125%, we can save $6.33 a month," Dave reported to me one day. "That may not sound like much, but over the course of the loan, that would add up to the price of, say, a 486 notebook computer."

And when I started talking about a decorating plan, Dave set out to find the perfect CAD software package.

"We'll be able to take photos of each room, scan them into the PC and then decorate on-line!" Dave said. "We can move the couch here and the china closet there without any backbreaking labor. It'll be a cinch."

OK. I can be flexible. I can go along with the idea of computerized furniture arrangements. And it may be nice to have a printout of our anticipated household expenses from now until the year 2023.

But do we really need a LAN?

Dave thinks it's a great idea — and he said it won't take up much space at all.

"We can put the server in the linen closet," he said. "Then as the little ones come along, we can add dumb terminals."

Kelly is a *Computerworld* copy editor.

Tools won't help if you don't know what you're doing

OPEN MIND *by* Esther Dyson

Many organizations are building "work flow" systems these days. Not all of them understand, or will reap, some of the most important benefits that true work-flow can provide.

In principle, a work-flow system is any system that includes people interacting through a computer to complete a task.

Ostensibly, the basic reason for work-flow systems is to automate routine work. But if you use that definition and that reasoning, what you'll get is something that could be a standard multiuser mainframe application — a system that speeds up and streamlines tasks rather than recasting the work process. You'll get a conventionally rigid, application-oriented system that is impossible to understand in terms of work flow — and also impossible to modify.

Real work-flow systems won't just happen because the tools exist to create them. Good tools don't create good systems.

The current range of tools provides the proper abstractions and concepts — a person, a task, a routing list, an approval cycle — for development of flexible, process-oriented systems. Indeed, the benefit of the new work-flow tools isn't so much that they automate processes but that they make them understandable. These tools are for communication as well as design. People other than the original developer can change such a system easily because the structure and sequence of the work processes are visible.

Thus, aside from power and the ability to handle sheer volume, the mark of a good work-flow system is flexibility, both in design and operation. It should be easy for users both to build a work-flow system and to define ways to handle exceptions and change the work flow in response to changing conditions ("exceptions" that become permanent).

After all, if you read current management literature, you know that the most valuable capability IS can offer a company is not cost efficiency but the ability to change quickly, to re-engineer itself and to learn. In a service-oriented world that's moving ever faster, a company that can change its processes as well as its products has a powerful competitive advantage.

To illustrate, first think of the software video cliche of the 1980s: Five yuppies sit around a table. One says, "What if we changed this figure here?" And the graph on the screen magically redraws itself.

The video of the '90s? A racially mixed, casually dressed group is discussing a merger. "Now that we've acquired Wondercorp, we have to link it into our customer-support process. When a message comes in, it should go to support first, then to the Wondercorp Quality Control team...." The work-flow chart on-screen automatically redraws itself (and the work-flow code is also automatically updated).

In the end, work flow is a thinking and designing aid as much as it is a system for automating work. But real work-flow systems — flexible, '90s-era work-flow systems — won't just happen because the tools exist to create them.

Good tools don't create good systems. Only you can do that, by taking advantage of a tool's ability to model and design a business process and by making it your business to understand what people are really doing in their jobs.

Dyson is editor of two newsletters: "Release 1.0," about emerging software technologies, and "Rel-EAST," about emerging computer markets in Eastern Europe.

They tell you they need imaging. You tell them they need Wang. Here's what happens next:

They say: "Wang is finished."

You say: "Guess again. They're putting a ton of money into their imaging group. They're shipping products. And the word is, there's a lot more coming."

They say: "Yeah—Proprietary platform stuff, right?"

You say: "Wrong. PC- and UNIX-based stuff. Windows. NetWare. *Open* stuff."

They say: "Well . . . So what? They can't image-enable *our* system, anyway. We've got multiple platforms, multiple languages, *all kinds* of networks . . ."

You say: "Wang can image-enable any environment. IBM. DEC. UNIX. Windows. Anybody."

They say (after a pause): "No kidding?"

John L. Sullivan
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Commentary

Charles Babcock

The Next direction

Yogi Berra onee said, "When you eome to the fork in the road, take it." Next, Ine. in Redwood City, Calif., eame to a fork in the road last month. Fortunately, it knew which direetion its customers wanted to take.

Next has dropped its line of elegant blaek boxes. It is selling its automated faetory in Fremont, Calif., and is focused on its eustomers' interest: the NextStep objeet-oriented software environment. By May 25, NextStep will be available on standard Intel I486 hardware.

IBM and Apple through their Taligent unit and Mierosoft with its Cairo projeet are all at work on something similar, but deliverable systems are a year or more away. With four years' experience in building and supporting an objeet-oriented applieation development system and a price tag ($2,800) that puts NextStep in a different league from the few existing produets of this type, Next has the lead — if it ean find the means to exploit it. Next's management ranks have been thinned by resignations and layoffs, and last week President Peter van Cuylenburg announeed his departure.

The objeet-oriented approaeh brings the concepts of reusable eomponents and modular strueture to the development of software applieations. It also brings the potential for large-seale effieiencies.

Capers Jones at Software Produetivity Research says we won't realize truly dramatie savings in software development costs until we adopt more of the principles of object orientation. In a study of 50 programming languages, he found that a funetion point requires 128 statements in a C program, 108 in Cobol and only 28 in an objeet-oriented language. In addition, those 28 statements are easier to maintain and reuse than their third-generation eounterparts.

Uphill battle

But it's not neeessarily easy adopting the objeet-oriented approach. Programmers and analysts must give up their business process models and flowcharts to think in terms of objeet behavior analysis. And payback for the initial effort is slow. Much of what passes for object-oriented programming these days is the use of SmallTalk or C++ to add isolated objeets to proeedural programs.

Building applieations in an integrated, objeet-oriented environment produces eomponents that can be revised, upgraded and reassembled into new systems. Object-based systems are easier to maintain than proeedural systems because an objeet ean be documented and revised without disrupting other objects. And the more times an objeet is used, the greater the return on its development.

NextStep is an operating system that contains elosely integrated objeet and database tools. It is based on the Mach operating system, in whieh proeesses eommunieate by message-passing in a vein similar to the way objeets eommunieate with one another. Mach also runs a large ehunk of Berkeley Unix as a server, giving it eharacteristies of Unix as well as its own unique profile. (Taligent's Pink is also based on Mach.)

In addition, Next has extended the eonventions of the GUI. At Next's unnaturally quiet headquarters, product manager Riek Jaekson illustrated how a user eould tap a file direetory on a remote maehine and then drag and drop its name to a "shelf" at the top of the window, wherc it becomes an ieon, available to the application.

When Next confronted the fork in the road, it knew whieh way to go. That way is still less traveled, but it is clearly the direetion that mueh of applieation development will have to take. The remaining Next staff members have a chanec to lead the earavan.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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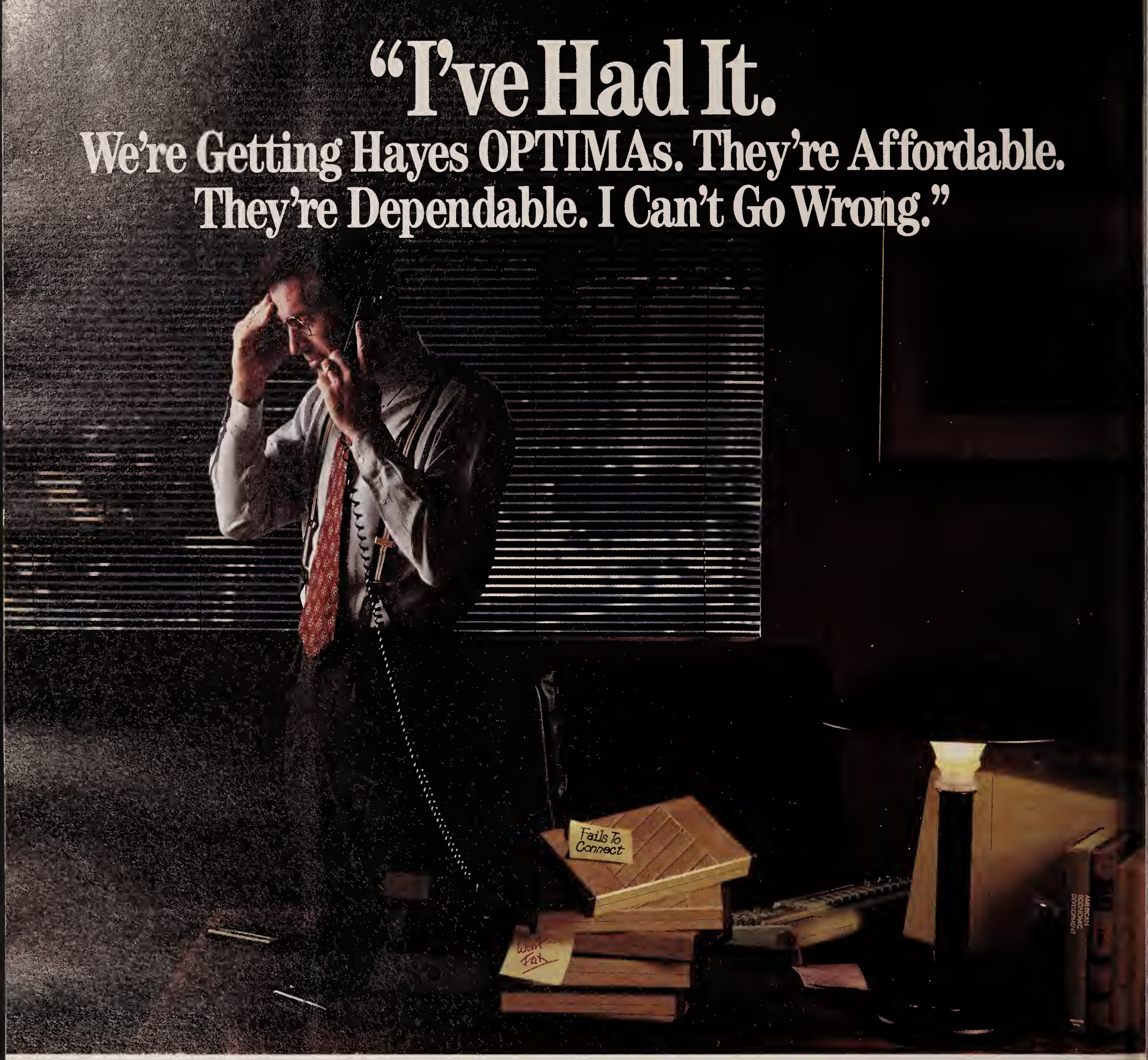

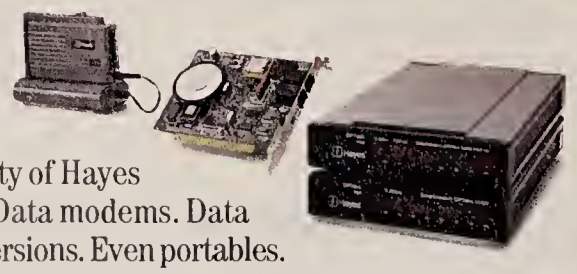

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Hermes debuts at Windows Summit

By Christopher Lindquist

■ Microsoft Corp. has had Hermes flying around the country recently, and the Windows NT-based systems management technology has been turning a few heads.

"Hermes is sort of the bride and groom dolls on top of the wedding cake, and the cake is Windows NT," said Bill Higgs, vice president of software research at Computer Intelligenee/Infocorp in Santa Clara, Calif. "This is supposed to be the software that demonstrates the value of NT in the networked world."

Higgs said Hermes technology will create some of the "reassurance" products that Microsoft will use to help convince information systems managers that it is serious about playing in mission-critical markets.

Indeed, Microsoft has recently been quoting figures that puts the cost of installing software on 2,000 PCs at around $5 million per year. Hermes, according to Microsoft, is the code name for a collection of technologies intended to ease the installation and support of software on a network, thereby lowering costs.

While Hermes has had its name bandied about for some time, two weeks ago marked the first public demonstrations of the technology, including demonstrations at the Windows Summit in Carlsbad, Calif., Microsoft Tech-Ed in Orlando, Fla., and Interop '93 Spring in Washington, D.C.

Among the goals set for Hermes are the centralized distribution and support of software, remote monitoring and control of nodes and hardware configuration management. Demonstrations of the product have included "drag-and-drop" installation of software across a network.

For example, a systems manager could have Hermes technology identify all of the 386- and 486-based PCs with more than 40M bytes of free disk space on a network. He could then have Hermes install a new software package on each of those PCs, and even have Hermes configure the software according to the hardware requirements of the machine, such as installing the proper device drivers for different video adapters.

Such installations are accomplished through a variety of means, not the least of which are scripts that describe how the software is to be installed on each machine. The systems manager can write these scripts, or they can be supplied by third-party software vendors.

Hermes would also support a licensing application programming interface (API) that would inform users if they were attempting to run, say, the 101st copy on a license that only called for 100 copies and would prevent the program from executing. Systems managers could also operate a user node remotely to help determine and fix problems without having to go onsite.

Not alone

There are issues, however. Hermes will not be the only player in the market. IBM, Lotus Development Corp. and Borland International, Inc. are reportedly working on products in the same vein as Hermes, and Computer Associates International, Inc. is positioning its Unicenter products as a competitor. Indeed, IBM already has its Configuration, Installation and Distribution Services product for software distribution, though it is currently restricted to installing software on OS/2 machines.

Some customers and vendors may also be wary of the power Microsoft could wield if it has access to all the information Hermes is promising to collect, said Jesse Berst, publisher of the "Windows Watcher" newsletter in Redmond, Wash. While the licensing API sounds good, "Do you really want Big Brother on a network shutting you down because you have 101 licenses instead of the 100 you paid for?" Berst said, noting that some customers might prefer quarterly checks on licenses rather than Hermes' instantaneous reporting.

One user who said he had seen an early version of Hermes being tested indicated that there could be some problems with network traffic if systems managers are not careful. For example, he said a forced installation of a new application distributed to 500 people who all logged on around 9:00 in the morning could cause significant traffic problems. However, Hermes "looks like its going to be real, real good" overall, he said.

Microsoft is quick to say that Hermes is not a product in and of itself. Hermes technology, due by year's end, may be marketed in a variety of ways, including systems aimed at smaller local-area networks and others intended for large-scale wide-area networks. Hermes will also include support for several platforms, including Windows, Windows NT, DOS and the Apple Computer, Inc. Macintosh. Hermes itself will require a Windows NT server.

Hard to handle

Sources indicate that Hermes is coming along well and should make its year-end ship date. However, of three recent demonstrations, only one, at Interop, was actually Hermes. The others were Visual Basic mock-ups. The reason: It is difficult to carry around a large LAN for demonstration purposes, and Hermes is still not ready for prime time, according to Dave Berry, Microsoft product manager for systems management services. "If you hold its hand, it kind of works now," he said.

Humor

Paul Gillin

Your turn, Windows

Having given OS/2 its lumps a few columns ago, I'm not happy to share my advice on how to get the most out of Windows 3.1. First, let me say how much I like Microsoft and that I think Windows is a great product and how Microsoft should never, EVER stop sending me free software because I like it so much.

Windows 3.1 is much better than Windows 3.0 because it has gotten rid of the annoying and frequent Unrecoverable Application Errors and replaced them with annoying and frequent General Protection Faults (GPF). This is a much easier error message to pronounce.

Gillin, *page 38*

Multimedia technology

Asymetrix tightens links in Windows graphics tool

By Michael Vizard
BELLEVUE, WASH.

As presenters move to adopt multimedia technology in a never-ending quest to add more pizzazz to lifeless data, users are discovering that existing presentation graphics packages leave a lot to be desired when it comes to handling audio and video.

To address this problem, Asymetrix Corp. has launched a presentation graphics package for Microsoft Corp.'s Windows that was designed to handle multimedia elements from the ground up.

Offered at an introductory price of $99 until July, Compel 1.0 includes a hyperlinking facility that lets users link supporting data to any item in the presentation simply by clicking on the mouse.

And while other presentation graphics packages are capable of supporting multimedia objects, Compel's facilities for creating and managing these objects will set it apart from existing offerings, according to Jesse Berst, publisher of the "Windows Watcher" newsletter in Redmond, Wash.

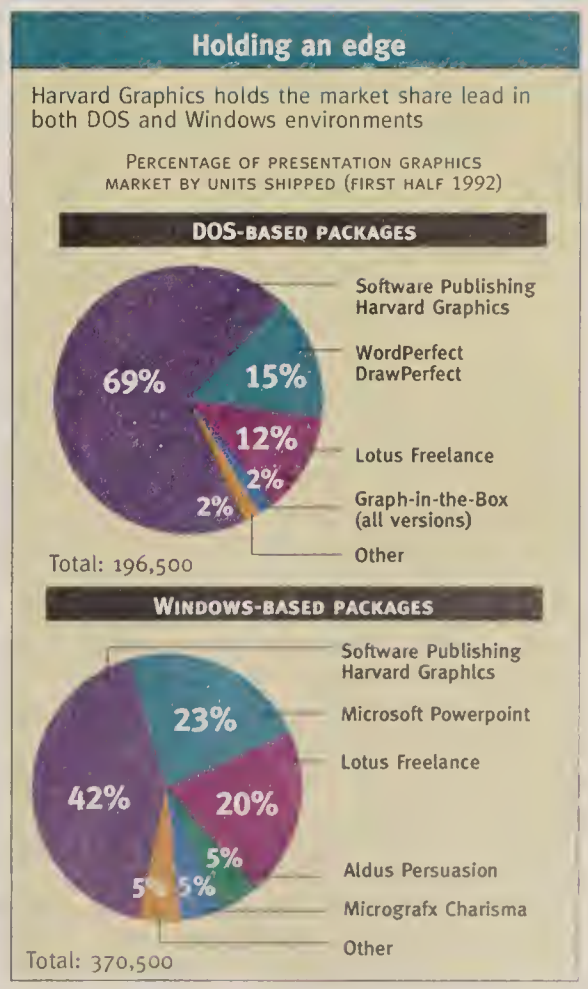
"Compel handles housekeeping issues better. It provides pointers and subdirectories that automatically link files all over the disk. The triggers and sequencing of objects are well-handled," Berst said.

In addition, Compel, which will be priced at $295 after July, supports on-the-fly compression and provides a facility that will automatically distribute a presenta-

Asymetrix, *page 38*

Holding an edge

Harvard Graphics holds the market share lead in both DOS and Windows environments



Source: International Data Corp.

Notebooks

NEC Technologies rebounds with versatile Versa notebook

By Michael Fitzgerald
BOXBORO, MASS.

NEC Technologies, Inc. has at least temporarily regained momentum in the notebook market thanks to its new Versa notebook, analysts and users said. The new family boasts a local-bus graphics scheme, and everything but the processor is upgradable.

The Versa will use the 20-MHz and 25-MHz versions of Intel Corp.'s I486SL processor, and the 33-MHz version when it is available. Versa has a user-upgradable hard disk and random-aeeess memory, a reversible, user-upgradable sereen (from monochrome to eolor or to pen-eapable), a floppy drive that ean be replaeed with a battery for extra battery life and two Personal Computer Memory Card International Association (PCMCIA) Type II slots. The monochrome version weighs 6.1 pounds, while the color version weighs 6.8 pounds.

> "Right now, the Versa is the notebook I would tell users to go buy."
>
> — *Jeffery Henning, BIS Strategic Decisions*

Users said the Versa looked interesting to them.

"We were looking for versatility," said David Pinkard, senior network teehnieal speeialist at Mallinekrodt Medieal, Ine. in St. Louis. Mallinekrodt will probably buy several hundred Versas this year. "The big thing we saw with the Versa was the ability to do a lot of upgrading. We're facing the problem of how long you write off an asset; mieros beeome obsolete in two years, but we're writing them off over five years, so anything we ean do to protect our investment is a help to us."

Pinkard cited the ability to upgrade memory and the PCMCIA slots as two features that were of particular importanee.

Analysts praised NEC for its design efforts, which synthesize a number of features that other notebook vendors have offered, such as upgradable sereens, upgradable hard drives and the removable floppy drive.

"Right now, the Versa is the notebook I would tell users to go buy," said Jeffery Henning, an analyst at BIS Strategie Deeisions in Norwood, Mass. "It makes a lot of sense for companies because it is so eonfigurable. You know you ean have it for the next five years and it'll last."

Henning also eited NEC's "elegant" design.

Still, some analysts said NEC's elever design will not set it apart in the market for long and may not draw customers to it.

"The issue for them is getting onto eorporate short lists. They don't have the best prieing and volume in the channel. The features don't give them a major leg up beeause in the market it comes down to marketing battles," said Bruee Stephen, an analyst at International Data Corp. in Framingham, Mass.

Even some NEC users, while they liked the produet, said other notebooks continue to top their buy lists.

"There still isn't anything out there with a screen as good as the IBM Thinkpad 700C," said Richard E. Nelson Jr., vice president of ageney systems at New York Life Insuranee Co., whieh uses both NEC notebooks and the IBM Thinkpad line.

Nelson said the Versa's active-matrix color screen, at 9.45 in., simply did not match IBM's 10.4-in. sereen.

Versa pricing ranges from $2,659 at the low end to $4,539 for a high-end, active-matrix eolor version with a 180M-byte hard drive. All versions exeept the pen-eapable models are now available, although NEC does not expect to begin volume shipments until next month.

Asymetrix tightens links

CONTINUED FROM PAGE 37

tion aeross multiple floppy disks, he said. The latter eapability is useful for ereating presentations that are then displayed on another PC.

"To add video and audio to other presentation graphies packages is very diffieult. You have to write a lot of seripts. Compel aeeomplishes this with just one mouse eliek," said Mark Hopper, direetor of sales at AuraVision, Ine., a manufaeturer of video ehips in Fremont, Calif. Before moving to Compel, Hopper said, he previously used Powerpoint from Mierosoft and Harvard Graphies from Software Publishing Corp.

Along with Lotus Development Corp., Mierosoft and Software Publishing are the dominant players in the presentation graphies market.

Top player

According to International Data Corp., Software Publishing is the dominant player in the DOS market, with a 69% share as of the second quarter of 1992, while maintaining a 42% share in the Windows market. IDC estimated that 370,500 presentation graphics packages for Windows were shipped in the first half of last year, compared with 196,500 packages for DOS systems.

Heat is on

According to Berst, Software Publishing has been under signifieant pressure from both Microsoft and Lotus, whieh bundle their presentation graphies packages with suites of Windows applications.

In particular, Mierosoft has benefited the most from bundling Powerpoint with Microsoft Offiee.

"Mierosoft Offiee has been so successful and has given Powerpoint momentum. It's a de facto standard at a lot of sites," Berst said. Aeeording to International Data Corp. (IDC), Powerpoint has a 23% share of the market.

"The percentage of Microsoft Offiee users who don't use Powerpoint is now down to 20%," noted Cathy Harris, a Powerpoint produet manager.

"One of the first applieations to move to Windows are presentation graphies packages, and I'm not sure Software Publishing will be able to keep up with the suites," Berst said.

To eounter Microsoft and Software Publishing, Lotus has been foeusing on pushing its SmartSuite set of applieations, whieh is expeeted to boost sales of presentation graphies. Lotus has a 20% share of the Windows market, aeeording to IDC.

Lotus also delivered Version 2.0 of Freelanee Graphies for Windows, whieh provides support for some multimedia eapabilities and a range of enhaneements designed to make the produet easier to use.

Also making a play in this market is WordPerfeet Corp., whieh plans to deliver WordPerfeet Presentations 2.0 this summer. Like Freelanee Graphies, WordPerfeet Presentations is prieed at $495. Harvard Graphies is priced at $595, and PowerPoint is prieed at $495.

Gillin

CONTINUED FROM PAGE 37

GPFs won't cause your system to crash more than eight or 10 times day, so please don't worry about them. Windows is a perfectly stable operating system shell as long as you don't do something stupid that violates system integrity, like starting two applications at once or attaching to a network. If you do make such a bonehead mistake, Windows 3.1 has loads of very nice auditing features that help you diagnose why you just lost last month's entire accounts receivable file.

Danger zone

One is an attractive blue sereen that pops up just before your system erashes and tells you that Windows has beeome unstable and must sit down and think about things for a while. This kind of advanee warning is enormously helpful in giving you time to ehoose whieh brand of razor blade with whieh to slit your wrists after your morning's work disappears in a eloud of helieal moleeules. You ean either wait an hour until Windows has had a couple of drinks and settles down or just turn off your computer and get it over with quickly. Helpful hint: Save time.

> **Windows 3.1 has made people with 60M-byte disk drives and 4M bytes of memory feel like real wimps.**

Windows also has a much nieer developer's interfaee, whieh has enabled third parties to write software that does things sueh as make your icons squeal like a pig when you drag them across the screen. In the computer industry, this is called "multimedia" and is supposed to increase your productivity dramatically.

But the best thing about Windows 3.1 is that it has made people with 60M-byte disk drives and 4M bytes of memory feel like real wimps. You can use Windows with less than 4M bytes of memory but only use the eloek and maybe the calculator (though you shouldn't use the memory key on the ealculator).

The reason Windows needs so much disk spaee is beeause it has something ealled a "swap file" that it uses for virtual memory, whieh is an operating system's way of treating the hard disk like a eat treats a litter box. Windows leaves little droppings of "data doo-doo" in the swap file that it ean't fit into memory to the point that the swap file grows to Orson Wellesian proportions and threatens to send out for pizza.

There is a way to deal with this: Buy a bigger disk drive. The current rage is the attractively named "scuzzy" interfaee. This allows you to chain disks together when you run out of storage space until eventually you have a little chain of disk drives stretching out your door.

You will need this disk storage beeause Windows applieations have gotten quite big and eomplex as well. I suspeet they're getting payoffs from the scuzzy disk drive makers to do this. One reason is that many applieations now support Windows TrueType fonts. There are many sueh fonts out there — so many it is now possible to write very long memos in whieh no two letters look the same.

The best thing about Windows is that it is an aeeepted industry standard. Mierosoft elaims to have shipped approximately 1.6×10^{12} eopies of Windows in the last 12 months, and software developers are flocking to eonvert their tightly coded little DOS applieations into blobular graphical applications in hopes of selling them all over again to the same eustomers. This is an exciting development for the entire computer industry — especially the seuzzy disk makers.

Gillin is *Computerworld*'s executive editor. His MCI Mail address is 575-4120.

New Products

Software application packages

Alpha Software Corp. has announced Report Styler, a Microsoft Corp. Windows-based desktop publishing tool.

Report Styler has the ability to emphasize key points and clarify data for existing reports. A five-step method is employed that starts with software application packages to create the report. Then the method saves the report to a text file and imports the file into the Report Styler.

Report Styler costs $199.

▶*Alpha Software*
168 Middlesex Turnpike
Burlington, Mass. 01803
(617) 229-2924

Welcom Software Technology has released Texim Project 2.0, a Microsoft Corp. Windows-based project management system.

Features include the ability to perform trend analysis through performance profiles, risk management by statistical analysis and resource management from the cost side of a project.

A single-user version costs $1,295. Network prices start at $1,595.

▶*Welcom Software Technology*
Suite 275
15995 N. Bakers Landing
Houston, Texas 77079
(713) 558-0514

Microsoft Corp. has started shipping the CD-ROM version of Microsoft Office for Windows.

The product is a suite of business applications for Windows that bundles Microsoft Word Version 2.0, Version 3.0 of the Microsoft PowerPoint presentation graphics program, the Microsoft Mail Workstation License Version 3.0 and Microsoft's Excel Version 4.0. On-line documentation and an integrated installation program are included.

Microsoft Office for Windows on CD-ROM costs $750.

▶*Microsoft*
1 Microsoft Way
Redmond, Wash. 98052
(206) 882-8080

Utilities

Intex Solutions, Inc. has announced a new version of Rescue Plus.

Designed for Lotus Development Corp.'s 1-2-3 and Symphony spreadsheets, the file recovery utility restores erased, corrupted, lost or damaged files on floppy or hard disks.

The product is not confined by any limitations of file or hard disk size. It returns forgotten Lotus passwords and works with .WK3 files. Two file formats of Lotus' 1-2-3 spreadsheets are supported.

Rescue Plus I costs $129.95, and Rescue Plus II costs $149.95.

▶*Intex Solutions*
35 Highland Circle
Needham, Mass. 02194
(617) 449-6222

Peripherals

Identity Systems Technology, Inc. has announced it will be bundling its standard and infrared mouse and trackball products with Mierografx, Inc.'s Windows Draw Limited Edition software. The purchase of the Identity three-button serial mouse, infrared mouse or serial trackball includes the software for free.

The serial mouse costs $59, the infrared mouse costs $79, and the trackball is priced at $69.

▶*Identity Systems Technology*
1347 Exchange Drive
Richardson, Texas 75081
(214) 235-3330

Systems

Diamond Technologies, Inc. has released the DT486 DLC-40, a 486-based PC.

Basic configuration for the DT486 DLC-40 provides a Super VGA color card and Super VGA monitor, an 80M-byte hard drive, 1.2M- and 1.44M-byte floppy drives and 4M bytes of memory, upgradable to 32M bytes on the motherboard. A serial mouse, MS-DOS 5.0 and a 101-key enhanced keyboard are also included.

The basic configuration price for the DT486 DLC-40 is $1,299.

▶*Diamond Technologies*
17165 Gillete Ave.
Irvine, Calif. 92714
(714) 252-1008

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GIS popularity growing

Applications help uncover geography-based solutions

By Maryfran Johnson
BOSTON

■ Serious interest in geographic information systems (GIS) is stirring in the business community as more companies turn to this technology to choose new retail site locations, optimize distribution routes or analyze the demographics of their target audiences.

Such interests were the focal point for nearly 2,000 in attendance at the recent GIS in Business '93 conference. Companies such as Levi Strauss & Co., Arby's, Inc., Consolidated Rail Corp., Federal Express Corp. and Wisconsin Power & Light Co. came to talk about their experiences using GIS to integrate mapping, graphics and spatial data with traditional business data such as spreadsheets and statistics.

Products such as Arc/Info *simplify complex mapping*

"Business interest is much higher now," said Hal Reid, vice president of development research at Arby's in Miami Beach. Yet it is often marketing, planning or operations divisions rather than IS departments that seem more attuned to what GIS can offer, he added.

"The major client for MIS is usually accounting and payroll, which is the static side of the business. They don't seem connected to GIS at all," Reid noted. He has two urban geographers using PC-based GIS applications for strategic development planning, franchise administration and demographics analysis. The results, he added, have been reduced costs and increased capabilities in managing Arby's franchise territories.

At Walgreen Co. in Deerfield, Ill., the drugstore chain is using GIS applications running on a trio of Intel Corp. 1486-based PCs for planning and site development work. But like Arby's, it operates apart from the information systems group. "MIS people don't embrace this stuff very much," said Joseph Mercurio, director of planning and research at Walgreen.

Growing market

Even without marked IS enthusiasm yet, the market for GIS has grown to about $2 billion annually and is projected to scale up substantially during the next five years because of plummeting hardware costs and easier to use desktop software. Today, however, analysts note that GIS is perceived as an intriguing technology with no obvious role to play in mainstream data processing.

GIS enthusiasts argue that the scenario will change as companies recognize the importance of visualizing information in more accurate, flexible ways that incorporate maps with various data types. "People want to understand their customers and their coverages better,"

GIS, *page 42*

MapInfo establishes map-to-database link

Looking to unlock the reams of data stored in relational databases, MapInfo Corp. has added a SQL module to its mapping software for Microsoft Corp.'s Windows.

Designed to allow users to link data to a specific geographic area, MapInfo for Windows is based on a local database that resides on the PC. Data is imported to the MapInfo database and then displayed using maps that are created with the MapBasic programming language.

The addition of a SQL interface will for the first time let MapInfo users access remote data sources rather than just local file formats such as Lotus Development Corp.'s 1-2-3 or Microsoft's Excel spreadsheet, said MapInfo Chief Executive Officer Brian Owen.

"The SQL interface will allow mapping software to access data across the enterprise," Owen said.

Database formats supported by the SQL DataLink module for MapInfo include Oracle Corp.'s Oracle, Sybase, Inc.'s Sybase, IBM's DB2, The ASK Group, Inc.'s Ingres, Borland International, Inc.'s Paradox, Gupta Corp.'s SQLBase Server, Microsoft's SQL Server and Novell, Inc.'s NetWare SQL. SQL DataLink is based on SQL drivers supplied by Pioneer Software in Raleigh, N.C.

Organizations currently making use of MapInfo, which company officials said has an installed base of 40,000 licenses, include telecommunications companies, retail firms and health care institutions.

"Any time you have remote assets that need monitoring, MapInfo can be used to monitor them," Owen said.

MapInfo also released a maintenance upgrade of MapInfo for Windows and its MapBasic programming language.

MapInfo 2.1 is priced at $995, while MapBasic is priced at $795. The SQL DataLink module is priced at $595. MapInfo will be priced at $1,295 as of May 1.

Moving to NetWare 4.0

Planning critical to upgrade success

By Michele Dostert

In many departments, local-area networks have sprung up on an ad hoc basis, with little advance planning. Servers, applications, data and users were added haphazardly — wherever they fit — and did not reflect the structure of the department they served. Often, work flow was engineered to fit the LAN's illogical structure instead of the LAN's being re-engineered to fit a logical work-flow structure.

Novell, Inc.'s new NetWare 4.0 LAN operating system, which has a logical, global directory service instead of the physical, server-specific bindery scheme used in earlier NetWare versions, was designed to change all that. But beta-test users stressed that in order to reap the full benefit of NetWare 4.0's directory, management and data compression features, considerable time must be invested in pre-upgrade planning.

"You need to use some low-tech tools first — paper, pencil, flow charts and mental effort — before you upgrade," said Sam Calderone, a systems specialist at Texaco Chemical Co. in Bellaire, Texas.

Do it right the first time

Early Version 4.0 users said the first step in planning an upgrade should be to inventory and review the data and applications on the LAN's servers, then decide how they should logically be grouped and stored. While it is not necessary to off-load and reload data when upgrading servers to NetWare 4.0, beta-test users recommended doing so.

"First, off-loading and reloading your data lets you take full advantage of 4.0's new volume management and data compression features," said John Miller, a network manager at HealthCare Co. in Downers Grove, Ill. "Second, if you're going to upgrade, do it right. Take the time to impose a logical structure on data that may now be illogically distributed."

Beta-test users urged others to study NetWare 4.0's directory structure and syntax. Its distributed directory requires network managers to view the network from a logical, rather than a server-centric, perspective. The user must also learn a whole new hierarchical syntax composed of trees, roots, branches, leaves, containers, objects and contexts. "It's not difficult once you understand the concept, but it's completely different from how NetWare 2.x and 3.x work," Miller said.

Novell recommended that network managers analyze their corporate work flow. After data grouping and server names have been decided, managers should next design logical groups of users who need similar access. Then they should study users' requirements to determine which groups each user should belong to. Once added to these groups, users will "inherit" rights common to that group, unless the manager uses the inheritance filter to limit rights.

A matter of rights

In earlier NetWare versions, each server had its own physical bindery, a flat file of users and rights for that server. NetWare 4.0's Directory Service, in contrast, generates a single, logical, hierarchical directory that is replicated across all servers in the network. Users logging on from anywhere in the network can thus see and access any server, device, application or data to which they have rights.

"You don't have to plan first; you could just upgrade the server and make every user his own group or just add him to groups you're thinking up on the fly," said David Eckert, a member of Westinghouse Electric Corp.'s Advanced Technology Group. "But if you do it that way, you'll end up with a huge mess, and it will be your own fault, not Novell's."

Once the first server has been upgraded and all network servers, devices, groups and users have been organized into its directory, other servers can be upgraded quickly. Network managers must simply off-load the data, upgrade the operating systems, reload the data and bring the server on-line; the NetWare Directory Service will automatically replicate the directory on each new server.

"You can easily upgrade a 10-server net in a weekend if you've done your homework first," Miller said.

Product claims easy document management

By Melinda-Carol Ballou
DUBLIN, OHIO

Information Dimensions, Inc. announced a new graphical document management product built on its Basisplus document database.

Designed for document-intensive workgroups in the aerospace, telecommunications, pharmaceutical, legal and government markets, DocWorks manages mixed object data and compound documents through the Basisplus engine but is much easier to use, company officials said.

"After we acquired Zylab [Corp.], we took their desktop expertise and ease of use and brought it to Basisplus by combining the technology of ZyIndex," said Bruce Duffy, a vice president at Information Dimensions.

DocWorks also launches applications so users are able to view and edit images, graphics, spreadsheets or computer-aided design drawings. Through DocWorks' hyperlinks, users can access all components of compound documents.

Users' choice

While most document management products fix an arbitrary number of document attributes through which users can access documents, DocWorks lets users choose the number and type of fields to associate with them, officials added.

The initial release, DocWorks 1.0, will support PCs running Microsoft Corp.'s Windows off of Unix and VMS-based servers. It supports Transmission Control Protocol/Internet Protocol and DECnet networks using Novell, Inc.'s LAN WorkPlace, Sun Microsystems, Inc.'s PC-NFS, Hewlett-Packard Co.'s ARPA Services and Digital Equipment Corp.'s Pathworks.

DocWorks is slated to ship in May. Pricing begins at $9,000 for a 20-seat license.

New Products

Gigatrend ships automatic tape changer

Gigatrend, Inc. is shipping a robotic device said to automatically change data cassettes contained in a desktop backup server.

Called Autochanger, it works with Gigatrend's network backup hardware and software and lets network managers store up to 60G bytes of network data at 50M byte/min. without being present to change tapes, Gigatrend said.

The device can be linked to a network file server or a tape station on a network. Unlike tape libraries, Gigatrend said, the Autochanger lets managers access specific files quickly — in less than two minutes — with file access software that can search for data randomly rather than in the sequence in which it was stored.

In addition to changing the tapes, the Autochanger software can manage the backup process, detecting errors such as improperly loaded cassettes and notifying the manager prior to the beginning of an unattended backup, the company said.

Pricing for the Autochanger begins at $11,550.

▶*Gigatrend*
2234 Rutherford Road
P.O. Box 4298
Carlsbad, Calif. 92008
(619) 931-9122

Workstations

Integrix, Inc. has announced the 50-MHz SS2+ Basic System (SS2+B) workstation.

The product is a Scalable Processor Architecture (SPARC) workstation that was designed for commercial and technical applications.

Features for the SS2+B include improvements in integer and floating-point performance.

In addition, the product operates with SunSoft, Inc.'s Solaris operating system, the company said.

Consisting of a 50-MHz system board, integrated Ethernet and Small Computer Systems Interface disk controllers and three S Bus expansion slots, the SS2+B also offers external connections that are identical to Sun Microsystems, Inc.'s SPARCstation 2, the company reported.

The SS2+B costs $2,995.

▶*Integrix*
1200 Lawrence Drive, #150
Newbury Park, Calif. 91320
(805) 375-1055

Unix

Wyse Technology, Inc. has introduced the Series 7000i Model 760MP, a True Symmetric Multiprocessing platform.

The product is a Unix-based multiuser system and network database server that can support more than 250 active users.

Scalable to five Intel Corp. 66-MHz i486DX2 processors, the Series 7000i Model 760MP exceeds 200 million instructions per second via the extension of CPU scalability, maximized bus throughput, disk and peripheral performance, a new system board design and advanced diagnostics, the company reported.

Users can boot the system remotely through an internal modem.

Prices start at $19,995.

▶*Wyse Technology*
3471 N. First St.
San Jose, Calif. 95134
(408) 473-1200

E-mail

WordPerfect Corp. has introduced WordPerfect Office 3.1 for Unix.

The product is an electronic-mail, personal calendaring and group scheduling package designed for Hewlett-Packard Co.'s 9000 Series 700/800 and IBM's AIX RISC System/6000, according to the company.

WordPerfect Office 3.1 enables users to communicate with others who are using a variety of platforms, including Microsoft Corp.'s Windows, Apple Computer, Inc.'s Macintosh, Digital Equipment Corp.'s VAX/VMS and DOS.

Message retraction, message tracking, encryption and optional automatic deletion, password protection and security notices are included.

A five-station package costs $495.

▶*WordPerfect*
1555 N. Technology Way
Orem, Utah 84057
(801) 225-5000

Workgroup software applications

Mergent International, Inc. has announced the Single Sign-On facility.

The product works in conjunction with the company's PC/Data Access Control System for Windows. Single Sign-On offers centrally managed, single-password sign-on to workstations, host connections and networks, the company reported.

Password expiration is managed automatically. Single Sign-On creates a proprietary recognition string of learned passwords and identifications.

Single Sign-On is available for corporate licenses only. A minimum of 25 units costs $6,500.

▶*Mergent International*
70 Inwood Road
Rocky Hill, Conn. 06067
(203) 257-4223

Local-area network hardware

Digital Equipment Corp. has introduced the DEC EtherWorks 3 Turbo network interface cards.

Created for users of AT- and Extended Industry Standard Architecture-compatible PCs and servers, the interface cards were designed to access remote printers, data files and other services across all major local-area network operating systems, according to the company.

Full client/server compatibility is provided with the following: DEC's Pathworks network operating system and Microsoft Corp.'s LAN Manager Network Device Interface Specification Version 2.0, The Santa Cruz Operation's SCO Unix, Novell, Inc.'s NetWare's Open Data-Link Interface v3.11 server and client and Banyan Systems, Inc.'s Vines protocol.

The network interface cards are available in three versions, with prices ranging from $155 to $185.

▶*DEC*
146 Main St.
Maynard, Mass. 01754
(508) 493-5111

GIS popularity

CONTINUED FROM PAGE 41

said Kathy Hale, an analyst at Dataquest, Inc. in San Jose, Calif.

Vendors such as Digital Equipment Corp., which has at least 50 software company partners in GIS, anticipate healthy growth in real estate and retail, said Dave Donelan, a GIS product manager at DEC. Environmental monitoring to meet government regulations is another hot area for businesses taking an interest in GIS, Donelan noted.

Today, most GIS applications run on distributed Unix-based workstations or PCs, and there are relatively inexpensive mapping and data sources available on CD-ROMs.

The Environmental Systems Research Institute in Redlands, Calif. — the granddaddy of all GISs — is moving into business markets with its new ArcView, a desktop mapping and GIS product. ArcView integrates map data, spreadsheets, business graphics, multimedia, large relational databases and word processing in a single desktop environment.

In the past, GIS technology has typically been used by local governments, federal agencies and utilities — places that could afford the system costs involved with proprietary midrange platforms and the staggering expense of data gathering.

Today, most GIS applications run on distributed Unix-based workstations or PCs, and there are relatively inexpensive mapping and data sources available on CD-ROMs from dozens of vendors, including the U.S. government's Topographically Integrated Geographic Encoding and Referencing, or Tiger, street-level maps.

Anticipating change

Levi Strauss took its plunge into GIS in the mid-1980s by integrating geodemographic analysis, mapping and internal shipment data with marketing analyses. Its first application was a distribution analysis and tracking system that made it possible to "anticipate change rather than just react to it," according to P. J. Santoro, a target marketing specialist at Levi Strauss.

The jeans maker is now developing GIS applications to help determine what merchandise mix is best for stores in particular trading areas, and it is integrating video images of its store displays into analysis and querying capabilities.

Scott McNealy, president of Sun Microsystems, Inc. and one of the keynote speakers at the conference, said Sun's internal use of GIS applications enables the $4 billion vendor to track its resellers and manage an estimated 4 million square feet of leased property worldwide.

"We believe GIS is a technology, not just a market," McNealy said.

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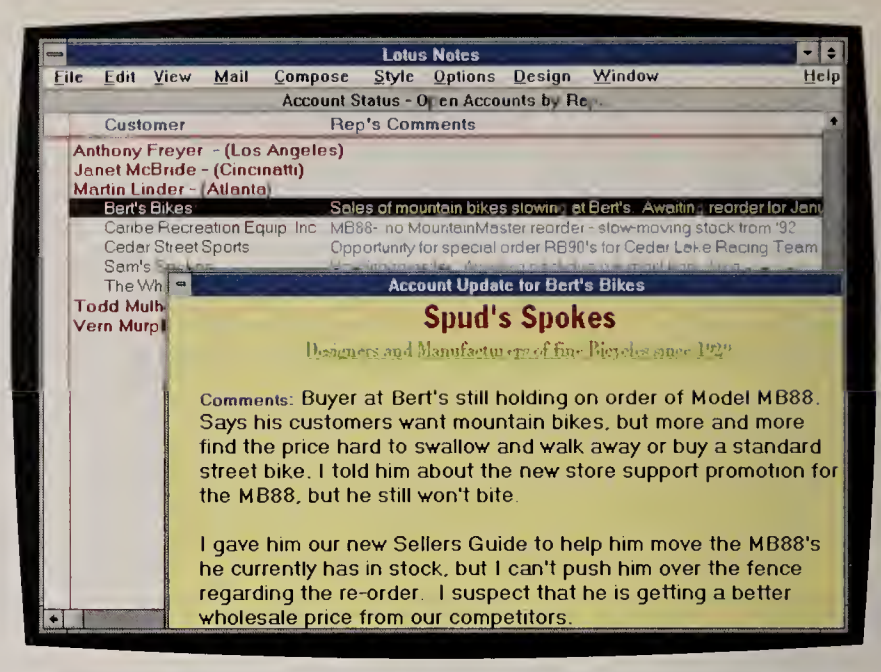
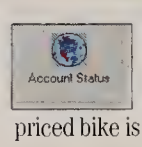
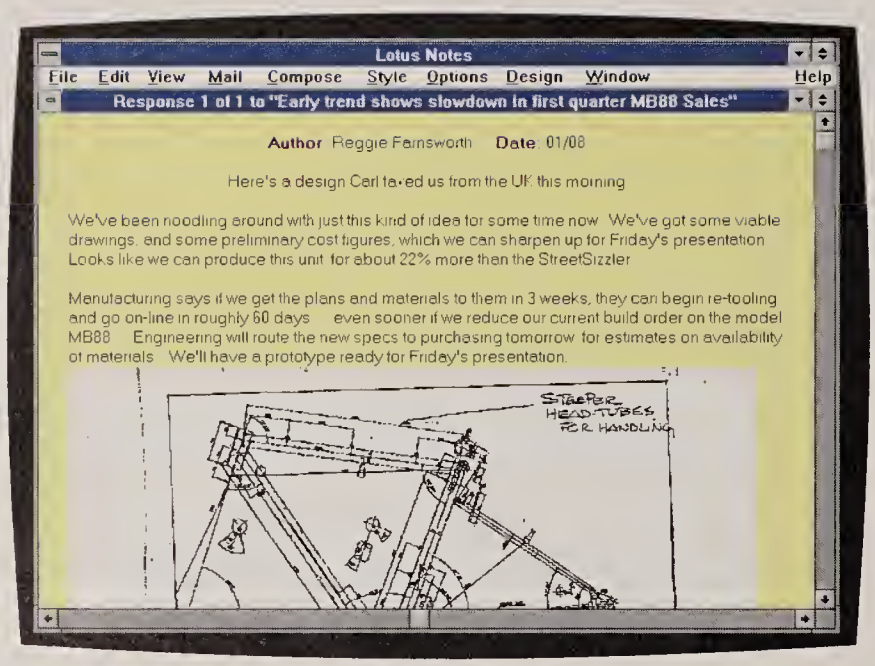
1. This is Michelle's Notes desktop. Each icon represents a different Notes application. She uses these to work with people all over the world including the field sales team, manufacturing, engineering, R&D, key customers and senior management. She regularly scans activities in the field by double clicking on ACCOUNT STATUS.



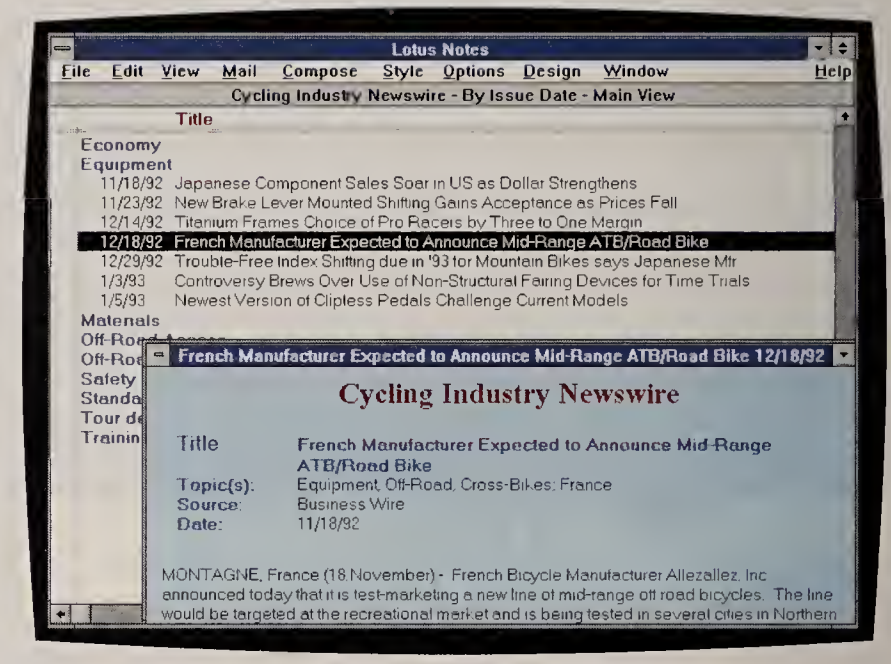
2. 

Today, she notices a number of entries regarding a slow-down in closing first quarter reorders for their most popular model, the MountainMaster off-road bike. It seems the market for this high-priced bike is beginning to dry up. This could be a major problem.



5.

The next morning she checks into the DISCUSSION database and this time finds an entry from Reggie in R&D. Reggie had also read Jim's message and is responding with a possible solution his people have been playing with. He pastes in an autocad illustration faxed to him from the U.K. using a Notes incoming fax gateway.



6.

With a presentation on Friday, Michelle gets down to some quick market research by opening up the CYCLING INDUSTRY NEWS database. An organized source of live industry data, it provides a news report on a French company that has a couple months head start developing a hybrid bike.

To see how fast you
Lotus Notes, just watc

What would you do if you suddenly found out that your key product was in trouble? Could your organization react quickly and effectively?

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Michelle Cliffington is a product manager for a bicycle manufacturer. She's responsible for all product planning, market research and marketing activities for her product line. Notes helps her shift gears and rush a new product to market.

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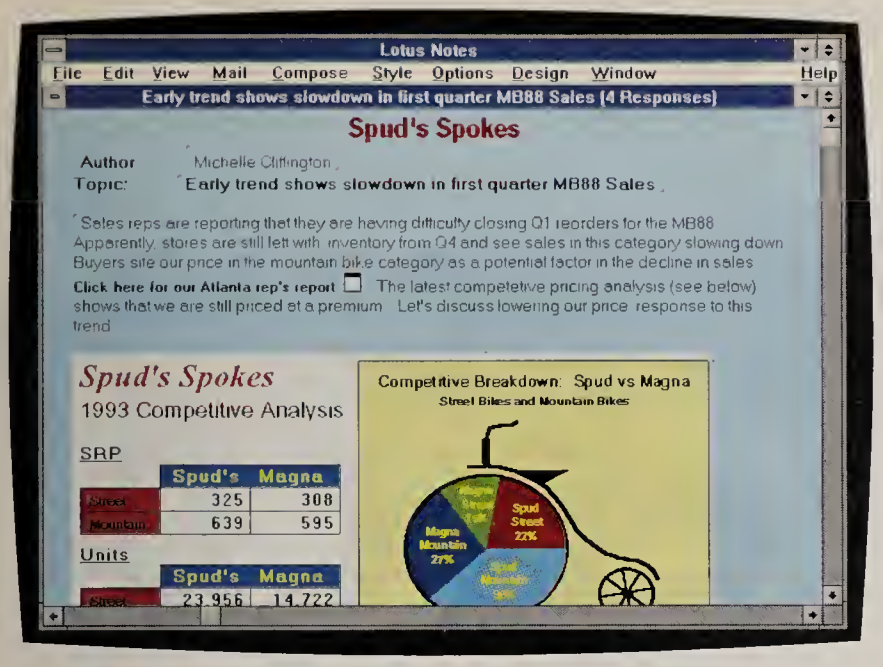
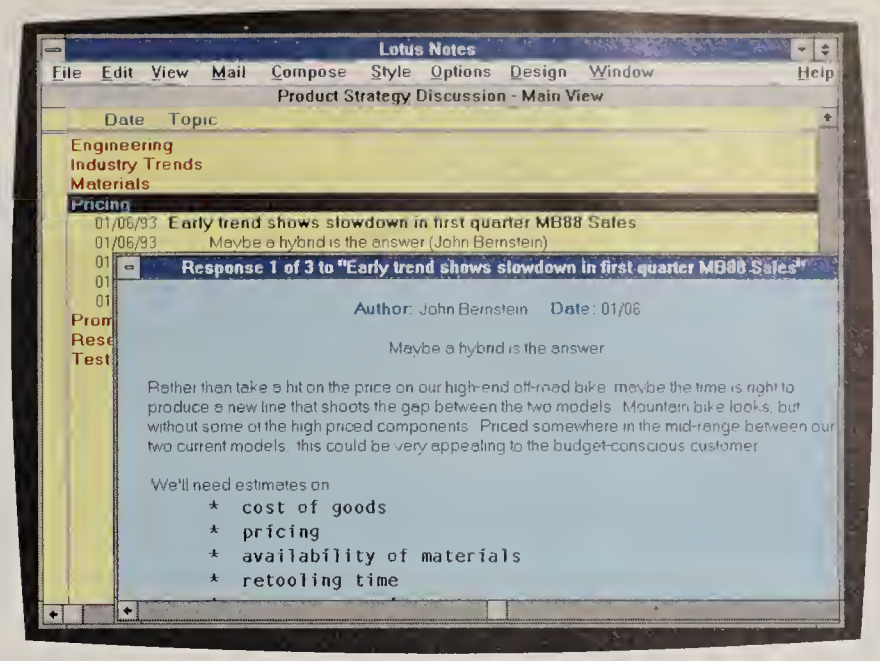


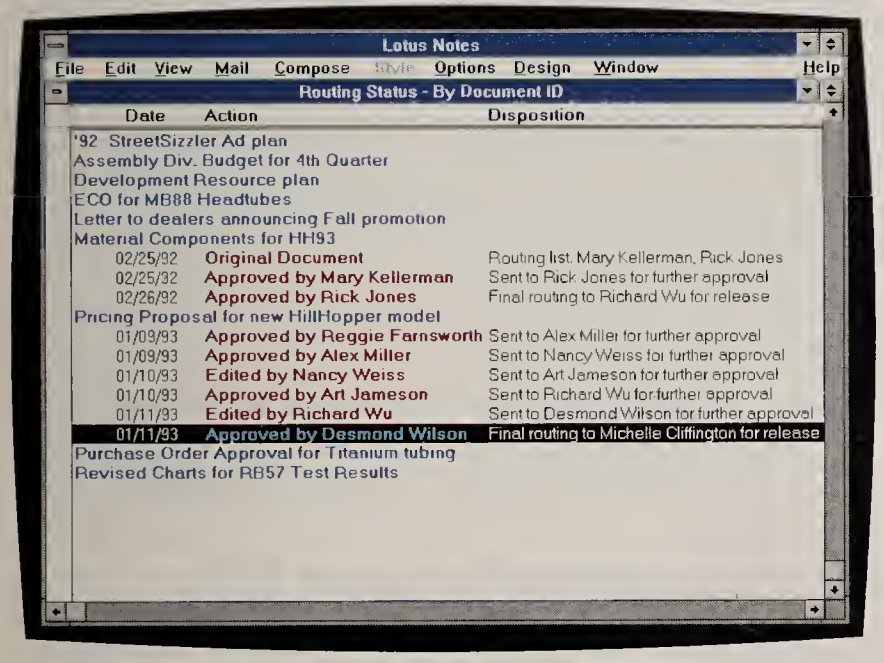
3. Product Strategy Discussion

She decides to recommend a price-reduction and double clicks into the STRATEGIC PRODUCT DISCUSSION database. This provides an organization-wide forum to discuss issues and brainstorm solutions. She links the report from the Atlanta rep directly into her Notes document. Then she uses DDE to embed some 1-2-3® charts into her document as well.



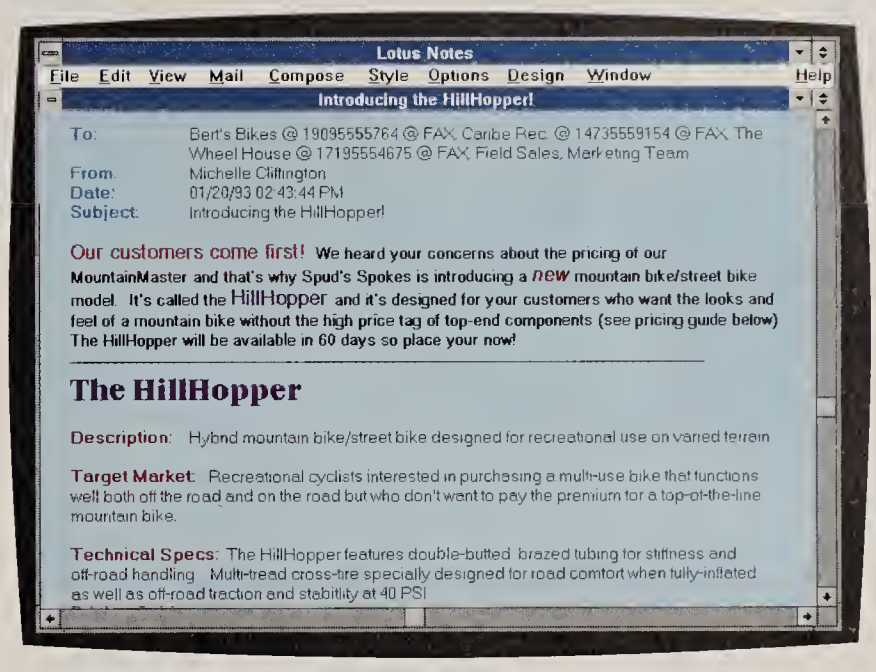
4. Product Strategy Discussion

Later in the day she re-enters the DISCUSSION database looking for responses. Her boss, John, has logged on from his hotel room in San Francisco. Rather than cut the margin, he suggests she explore the feasibility of adding a mid-priced bike to their line. He wants an initial presentation for Friday.



7. Routing Status

A few days after routing her proposal to the product team, she wants to find out where it stands within the organization. She opens the ROUTING STATUS application to find that it has worked its way through the organization to Desmond, the senior decision-maker, and has been finally approved. So she's on her way.



8. Customer Feedback

Michelle closes the loop by communicating the news to their customers. Double clicking into the CUSTOMER FEEDBACK database, she faxes a memo directly from Notes to all retailers. In it she explains that the company has heard their problems and responded with the Hill Hopper. And with delivery in 60 days, they can order now.

can respond with h Michelle shift gears.

effortlessly people use Notes to respond and move the project forward.

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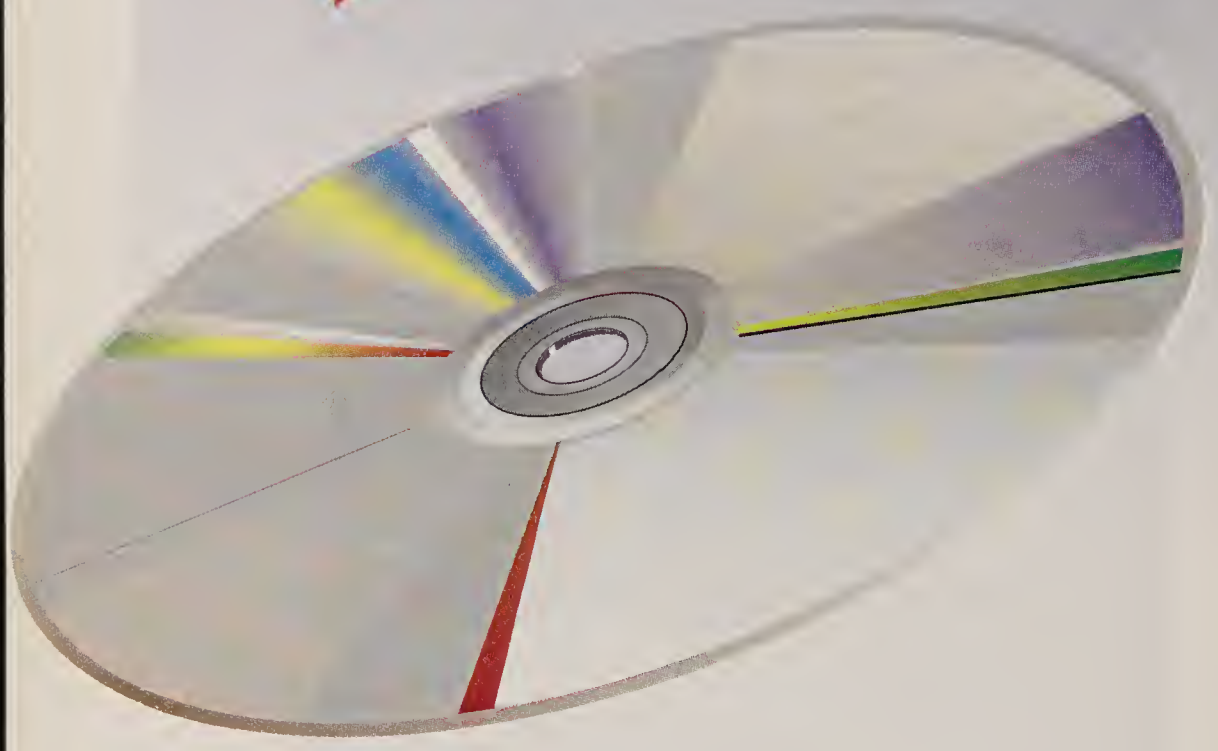

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LAN switch gains foothold

Hubs used to segment nets rather than increase bandwidth

By Joanie M. Wexler

While the emerging LAN "switching hub" is touted for providing a single user with the bandwidth of a full local-area network, companies today are more likely to use the devices to economically segment networks and unclog tributaries to corporate file servers, users and analysts said.

"The dominant reason people use LAN switches today is as a low-cost bridge or router alternative," said Fred McClimans, a program director at Gartner Group, Inc., a Stamford, Conn., consultancy.

"Most users are creating segments of 10 users or less, then attaching servers to dedicated networks," said Rich Erickson, vice president of sales at New York systems integrator Digital Network Associates, Inc., which sells switching hubs from Kalpana, Inc. and Synernetics, Inc.

The University of Missouri School of Medicine, which uses Kalpana's low-end EtherSwitch, has "no need for 10M bit/sec. to the desktop, though our file servers do," said Ron Neely, microcomputer support specialist.

So the school is using the Santa Clara, Calif., vendor's technology to create a hierarchy of LANs in which traffic, running through SynOptics Communications, Inc. wiring hubs, is internetworked through the Kalpana box (see diagram). This design means a user "is never more than one hop away from a given resource through the EtherSwitch," helping guarantee response time, Neely said.

At Time-Warner Entertainment Co.'s Home Box Office (HBO), a high-end LANplex switch from Synernetics in Billerica, Mass., is functioning as a "concentrator for back-end systems," said Michael Smith, network analyst.

HBO originally bought the equipment to accommodate graphics traffic generated by its creative services department and sent to expensive color printers. However, "we overestimated the bandwidth we needed and discovered [shared] Ethernet serves that purpose for now," Smith said.

So the company moved the LANplex into the data center where the company unstrung an arsenal of IBM RISC System/6000 application servers sharing one 10M bit/sec. Ethernet and gave each server its own 10M bit/sec. network.

Three options

The Synernetics gear — which 3Com Corp. resells as its 3GH hub — offers users the three-pronged option of dedicating 10M or 100M bit/sec. bandwidth to individual computers or for users to share a 100M bit/sec. Fiber Distributed Data Interface (FDDI) network logically configured inside the switch.

The Synernetics box costs approximately $50,000, Smith explained, and going the full FDDI route when he needed to boost performance a year ago would have meant shelling out roughly $10,000 per workstation adapter card. Per-connection FDDI prices have since dropped to about $4,000.

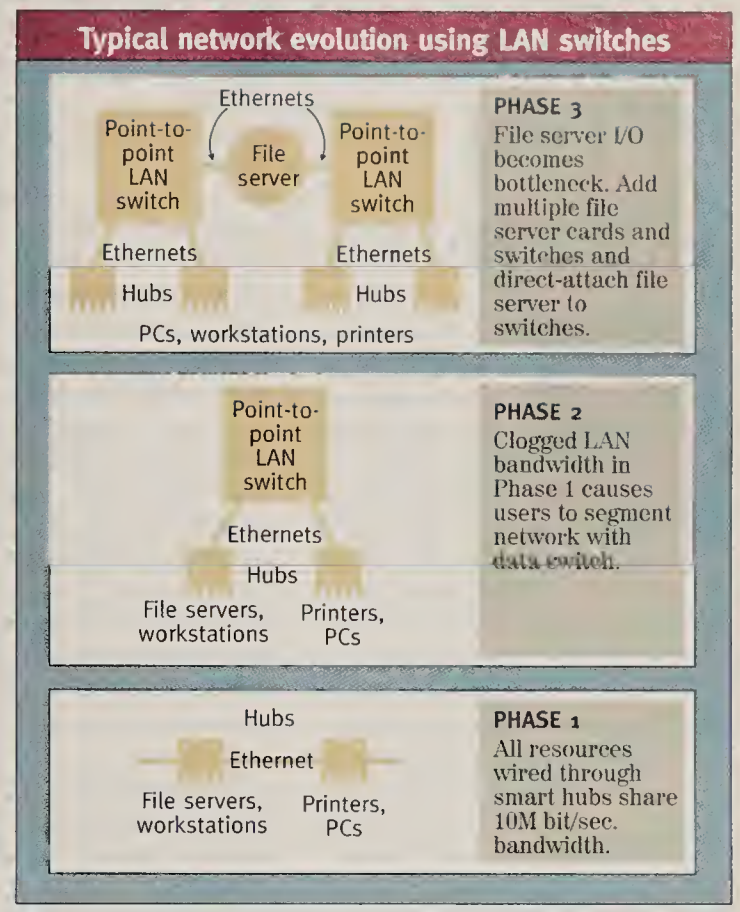
Smith also estimated that HBO saved approximately $45,000 by not buying a high-end FDDI analyzer because the firm could use existing Ethernet test gear.

In the financial world, the First National Bank of Chicago is using Alantec Corp.'s competing PowerHub switch in its software development environment "so we can separate servers and groups of people from each other to relieve performance pressure on the network," said Joe Cesario, a vice president in the bank's technologies and development group.

The bank, like the University of Missouri, dedicates one Ethernet to each of its servers, then uses other Ethernet ports to support groups of developers and smart wiring hubs, Cesario said. The design revealed that there were file server bottlenecks "that we had never noticed" because of the network's poor performance, he said.

Ark Asset Management Co. in New York is using five Synernetics switches "to give us options for how people access the network," said Paul Cucurullo, MIS manager.

LANplex "allows us to parse out who we want to have faster access" to the network, Cucurullo said. Traders, for example, need higher speeds because they access large chunks of real-time data when performing portfolio analyses, which involve sorting through large amounts of securities from stock exchanges. For basic word processing users, shared Ethernet still does the trick, Cucurullo said.



Source: *Computerworld*, University of Missouri Medical School

Per-port switching hub prices

Alantec PowerHub: $400 to $1,500

Kalpana, Inc. EtherSwitch: $700 to $900

Synernetics, Inc. LANplex: $1,500 to $1,700

Ungermann-Bass, Inc. DragonSwitch (slated to ship Q2): $900

Performance boost

For Novell, Inc. NetWare shops looking to build high-performance networks around LAN switches, the University of Missouri's microcomputer support specialist Ron Neely has some advice.

Neely, who uses Kalpana's EtherSwitches, pointed out that when users want to add more cards to their servers to boost server performance, "you need a corresponding port" on a separate switch. The reason, he explained, is that each card in a NetWare file server is required to be attached to a discrete network. That is because NetWare servers do their own internal routing — a function that cannot be disabled.

In other words, if a network administrator installs eight cards in a file server to match disk I/O speeds, "you'll need eight networks and eight Kalpana boxes," he explained. "But it's still cheaper than internetworking with routers and bridges."

The need for separate networks does not exist in the Unix networking world, Neely noted.

—Joanie M. Wexler

Security

Toll fraud threat growing

By James Daly

The theft of telephone services may be more pervasive than even the most dour security experts believed.

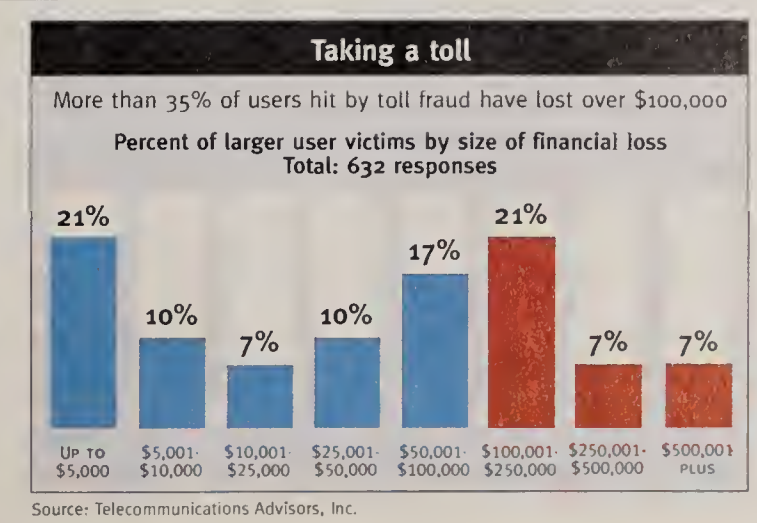
In a recent survey by Telecommunications Advisors, Inc. (TAI), an independent consulting firm in Portland, Ore., a startling 70% of the 632 users polled said they had been the victim of telecommunications toll fraud at least once in the past five years. Many were hit more than once. The median loss per user victim was $90,000.

"The results are foreboding," said John Haugh, chairman of TAI. "Three years ago, 70% of users didn't even know what toll fraud meant. Anyone who thought it would simply go away has to seriously re-examine their position."

TAI surveyed users at corporate information systems shops with anywhere from 600 to 6,000 extensions each. Most are equipped with nationwide toll-free lines as well as private branch exchanges (PBX) and voice mail systems — the primary entry points for those looking to steal telephone service.

Don Delaney, a senior investigator with the New York State Police,

Toll fraud, *page 49*



Source: Telecommunications Advisors, Inc.

Commentary

Jeffrey N. Fritz

Take FDDI in little bites

To read the literature, you'd think FDDI is a reliable, well-established technology. Want to run Novell over Token Ring through a 100M bit/sec. FDDI ring? No problem. Want to put an SNA environment through an FDDI router? Piece of cake. AppleTalk? Don't even give it a thought.

If you believe everything you read in four-color, glossy brochures, you will soon be convinced that FDDI equipment can handle any current or future protocol with style and aplomb.

I hope you don't believe everything you read.

In the real world

The reality is that FDDI is still an emerging technology and has some major flaws. FDDI vendors seem to be plagued with bug-laden router software and poorly trained technical support staff members.

Even the established market leaders seem to have their share of problems with FDDI — and sometimes the problems are so complex that even the "experts" aren't exactly sure what is going on. The router software you purchased may be shrink-wrapped and look polished, but once established, it may run like beta software.

This leads me to wonder, are FDDI vendors — in their rush to be the first with the latest — pushing software through their development cycles without adequate testing? Are vendors underestimating the wide variety of user environments that their equipment will face in the field? Or, in multiprotocol FDDI, have we finally encountered a technology so complex that it is hard to handle?

To be fair, the basic FDDI architecture is well thought-out and fault-tolerant. FDDI supports primary and secondary counter-rotating rings. If something happens to the primary ring, the secondary ring automatically becomes the primary ring. If both rings break, FDDI equipment will automatically wrap the ring at the break, creating two separate but still functioning rings.

The problem is with the translation of protocols on and off the FDDI ring.

In a multiprotocol environment, major snafus can occur in the routing software. In extreme cases, router software becomes so fouled that it can bring down the entire network.

It is impossible for FDDI vendors to anticipate all the environments in which you might deploy their equipment, so the user must be much more careful.

If you are planning to operate FDDI in a diverse, multiprotocol environment, be prepared for an experience that will try your patience and test the capabilities of your networking staff. The same complexities that plague router vendors will also work against your networking staff.

To preserve at least a little of your sanity, here are some steps that you should take if you are considering deploying FDDI in a diverse network environment:

1. Try to hold off deploying FDDI in a complex, multiprotocol environment. If you can operate with an alternate technology for a while, do so. That will buy time for FDDI technology to shake out and settle down a bit.

2. Test before you deploy. Testing is often a difficult process. It is nearly impossible to set up a comprehensive FDDI test ring unless you can find a way to put all the protocols found in your network on the test ring. If you can't, then your operational network becomes the test ring. Particularly if you are an early user of FDDI, this is very risky business.

3. Let your vendor know that you expect full and aggressive support in fixing any problems you encounter. Like everyone else in these cost-cutting days, FDDI vendor resources are limited. When backbone networks are down, waiting days or weeks for a fix can't be tolerated. The squeaky wheel may get the grease, but that only applies if the vendor has grease to apply to your problem. Some don't.

4. Try to keep in mind that some FDDI vendors behave like kids in a candy shop. They see so many potential dollars that they grab every possible feature and try to shove it as quickly as they can into their products. The difficulty with this candy shop scenario is that you — and not the vendor — will wind up with the FDDI stomachache.

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va. He has done extensive work on FDDI networks for his organization.

SNA on LANs gaining ground

APPN products on the way to help users with integration

By Elisabeth Horwitt
WASHINGTON, D.C.

■ The gathering market momentum of IBM's Advanced Peer-to-Peer Networking (APPN) protocol is causing savvy vendors to rethink their product strategies for helping users integrate Systems Network Architecture (SNA) with local-area network installations.

User interest in such products was evident at the APPN/Advanced Program-to-Program Communications Showcase held at the recent Interop '93 Spring show.

Hudson's Bay Co., for example, is evaluating IBM's OS/2 Communications Server and Digital Communications Associates, Inc.'s Select Server products, which took part in the showcase. The products are said to enable PCs to access much of the functionality of APPN without having to run the random-access memory-intensive APPN End Node protocol stack, according to Janusz Szaban, manager of host systems at the Toronto company.

Sync Research, Inc. said its SNAC line of Synchronous Data Link Control (SDLC) to Logical Link Control converters will have the ability by year's end to provide APPN End Node services to DOS PCs running IBM's PU2.1 or Low-Entry Networking (LEN) protocol. While LEN nodes can access APPN resources, they lack APPN End Node capabilities such as automatic registration of themselves and their resources on an APPN Network Node directory.

Szaban said he is also interested in emerging products that are said to convert IBM's SDLC traffic to Logical Link Control 2 (LLC 2) packets, which can pass over a LAN and then to the Quality Logical Link Control protocol, which can be routed over an X.25 or frame-relay backbone. Such a conversion would save Hudson's Bay from having to encapsulate its SNA traffic in Transmission Control Protocol/Internet Protocol (TCP/IP) packets for routing, Szaban said.

Several speakers at Interop warned against using TCP/IP internetworks to handle LAN-to-host SNA traffic, Szaban said.

"They said performance [over such links] is sublevel — that [TCP/IP] is good for casual connections but not for production-strength connections to the host," Szaban said.

Several recent product introductions target the needs of users such as Hudson's Bay:

•**Sync Research** introduced SNAC capability that uses a recently published IBM specification for defining older Application System/400 devices as PU2.1 devices. The devices can then set up sessions with an AS/400 host over a Token Ring LAN and from there over an X.25 or frame-relay link, said Richard Thunen, Sync Research's SNAC product manager.

The firm plans to release a similar connection for Ethernet LANs, he added.

•**Eicon Technology Corp.** in Montreal announced InterConnect Server, which is said to allow SDLC devices to communicate over a Token Ring LAN and over a wide-area network, at a price of $3,000 to $5,000. The product targets branch offices that want such connections but cannot afford to pay for both a router and an SDLC-to-LLC2 converter, according to a company spokesman.

The product's support of Point-to-Point Protocol will enable it to interoperate with whatever major router a corporation has on its backbone, the company said. The router portion of the product is said to handle Novell, Inc.'s IPX, TCP/IP and Apple Computer, Inc. AppleTalk protocols.

InterConnect Server is a Novell NetWare Loadable Module that supports LAN-attached PCs running DOS, Windows and OS/2. Support for IBM's OS/2, Microsoft Corp.'s Windows NT and Unix servers is planned.

•**Network Systems, Inc.** in Minneapolis said it is working on an architecture that will be able to route SDLC over LANs and route multiple protocols, including APPN Network Node, by the second half of next year. The product will be able to emulate an IBM 3172 channel-attached controller by the first half of 1993 and encapsulate "unroutable protocols" such as NetBIOS in SNA and TCP/IP backbones by 1995.

•**Jupiter Technology, Inc.** in Waltham, Mass., recently introduced LANWay, which is said to combine SDLC-to-LLC2 conversion with a gateway that puts asynchronous terminal traffic on Token Ring LANs. The series supports up to 32 ports and up to 256 concurrent sessions, at 4M and 16M bit/sec. Pricing starts at $4,500 for a three-port system.

Not top priority

Purchasing data network equipment from a single vendor is regarded as unimportant and should not be a major competitive issue for vendors, according to a Salomon Brothers, Inc. study. Twenty-two of the 50 respondents said one-stop shopping was not very important, while only 10 claimed it was. When asked which vendors offer the best one-stop shopping package, IBM and AT&T took the honors.

France leads way to ATM

France Telecom is planning to be the first overseas carrier to offer commercial Asynchronous Transfer Mode (ATM) network services, which are due in the second half of 1994, the firm announced recently.

The service will support speeds up to 34M bit/sec. and expand to 155M bit/sec. connections over time, said Yves Parfait, director of broadband networking at France Telecom.

France Telecom's ATM network will be interconnected with ATM-based networks from other European carriers through a referendum signed last November, Parfait said. The carriers include BT, Spain's Telefonica, Germany's Deutsche Telekom and Italy's STET.

The firm is now building an ATM infrastructure and will begin ATM trials mid-year, Parfait said.

Pricing for the ATM service will be based on use plus access charge. Details were not available.

In Brief

FDDI price drop

Ungermann-Bass, Inc. has cut the price of its Fiber Distributed Data Interface (FDDI) concentrator and adapter cards by up to 43%. Cards that attach computers to both of FDDI's rings are now $3,295. Single-attach cards are $1,995 and must be used with an FDDI concentrator, which now costs about $1,750 per port from UB.

Modems cost less

U.S. Robotics, Inc. has reduced prices on its Sportster line of fax and data modems by 42% to 52%.

Cellular in Florida

McCaw Cellular Communications/Cellular One last month launched digital commercial cellular services in Orlando, Fla. It reportedly has more than 1,000 customers.

MCI flies

MCI Communications Corp. has signed a five-year, multimillion-dollar contract with **Morris Air Service** for a dedicated private network linking the airline's Salt Lake City headquarters with all of its domestic sites. The contract also covers MCI Vision and 800 services, which include bill-back services, call volume tracking and other enhanced services previously available only to very large companies.

X.400 over TCP/IP

Messaging gateway vendor **Soft-Switch, Inc.** enhanced its distributed Enterprise Mail Exchange with support for running X.400 mail over Transmission Control Protocol/Internet Protocol networks. The Wayne, Pa., company also upgraded its North American Customer Support Center with around-the-clock support.

Copper and fiber

Northern Telecom, Inc. and start-up **Crescendo Communications, Inc.** in Sunnyvale, Calif., have teamed up to provide concentrators that support 100M bit/sec. network connections over both copper and fiber-optic cabling.

SDLC to Token Ring

Ascom Timeplex is reselling **Sync Research, Inc.**'s devices for converting IBM Synchronous Data Link Control protocols to Token Ring-compatible protocols and Sync Research's frame-relay assemblers/disassemblers. Sync Research also named Ascom Timeplex as its North American third-party service and support organization for its IBM protocol conversion products.

New Products

Network management

NetLabs, Inc. has introduced NetLabs/ServiceDesk, a software package.

According to the company, NetLabs/ServiceDesk is an automatic network "help desk" that enables users to track problems from beginning to end, keeping solutions ready for future situations.

Running as an application on the NetLabs/Manager network management platform, user-defined alarms notify the product about device failures and other problem conditions.

NetLabs/ServiceDesk costs $12,000 for four users.

▶ *NetLabs*
4920 El Camino Real
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(415) 961-9500

AT&T has introduced Accumaster Videoconferencing Management Services.

According to the company, the product was designed for large, multilocation, multinational users and is said to be the first complete videoconferencing network management outsourcing service among AT&T's major competitors.

Installation, network implementation, ongoing management and a variety of professional services including account management and asset management are provided.

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Gateways, bridges, routers

Teleglobe, Inc. has introduced the CL 5050, an addition to the company's ConnectLAN line of bridges and routers.

The product is available as either a remote Ethernet bridge (CL 5050B) or as an enhanced remote Ethernet bridge/router (CL 5050E). The CL 5050 incorporates bandwidth optimization techniques that include dial backup, data compression, express queuing and dial-on congestion, offering high-performance, multiprotocol internetworking solutions, the company reported. Support is provided for one Ethernet local-area network connection and two serial connections.

Pricing for the CL 5050 ranges between $3,750 and $5,000.

▶ *Teleglobe*
40 High St.
North Andover, Mass. 01845
(508) 681-0600

Cayman Systems, Inc. has introduced GatorBox EX, a dual Ethernet port router.

The product links Apple Computer, Inc. AppleTalk workgroups with Ethernet backbone networks. GatorBox EX has a 40-MHz Motorola, Inc. MC68030 processor-based platform and was designed for all Ethernet environments, the company reported.

Highlights include support for the company's GatorShare gateway software, Macintosh-based configuration and Telnet-based management; enhanced routing and filtering capabilities; and two Ethernet ports.

GatorBox EX costs $3,495.

▶ *Cayman Systems*
University Park at MIT
26 Landsdowne St.
Cambridge, Mass. 02139
(617) 494-1999

Toll fraud

CONTINUED FROM PAGE 47

said the illegal access and sale of telephone service has turned into a thriving underground business. Skilled hackers typically loop in and out of a firm's PBX to reoriginate calls and prevent line tracing.

They can then resell their means of entry to others, who in turn fill the telephone lines with more illicit traffic. A thriving call/sell operation attracts drug dealers, illegal aliens and organized crime figures.

Users reported attacks on all fronts, including manipulation of their PBX, penetration of voice mail and abuse of both the remote access and maintenance ports.

Who are the culprits? Users said computer hackers and insiders top the rogues' gallery, but some even suspect employees of their long-distance carriers. Such suspicions have already been borne out. Haugh said that about 18 months ago, MCI Communications Corp. helped prosecute and jail a former employee who was transferring telephone access codes to a boyfriend in prison.

Countermeasures include blocking remote ports, eliminating calls to foreign countries, doing a better job of monitoring call records and changing access codes more frequently.

Many security experts now count PBX toll fraud among the most pernicious of corporate security threats. It is easy to understand why. With many companies owning their telecommunications and phone equipment, major carriers said users are responsible and liable for added charges if they are hit.

Some long-distance carriers have begun to adopt a more flexible approach to toll fraud obligations — discounting and even on occasion forgiving such bills, according to Haugh — but forgiveness of debt generally occurs only when users can show they have taken reasonable precautions to protect their systems.

Long-distance carriers are also getting better at contacting customers to alert them about suspicious activity. In 23% of the survey's cases, users first learned of toll fraud from a service company.

Long-distance carriers have also begun to be more helpful in protecting against toll fraud. Last month, for example, MCI announced a broad initiative to help combat toll fraud. The Detect plan includes the monitoring of inbound 800 and outbound international traffic combined with an increased effort to contact customers about suspicious activity. Sprint Corp. and AT&T introduced similar packages last year.

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Spalding tees up client/server

By Rosemary Cafasso
CHICOPEE, MASS.

The process of hitting a baseball has changed little since 1876, but Spalding Sports Worldwide certainly has. Founded by baseball pioneer A. G. Spalding, the company today produces a broad range of sporting equipment, including 1 million golf balls a day. Now it is time for Spalding to reinvent its business processes, according to Bard White, chief information officer.

The technology and business procedures it uses to pump out baseball equipment, golf balls, clubs, basketballs, tennis balls and an assortment of other equipment are now in the midst of a major overhaul.

"We were on the same treadmill as everyone else, with a mainframe and just a zillion terminals hooked in," White said, "and when the machine got slow, you just went out and got a bigger one."

Spalding stopped the treadmill in 1990, when it officially launched a strategy to move from a Hewlett-Packard Co. host-based environment to a client/server architecture using newer HP equipment. At the same time, it is redesigning critical procedures, such as order processing, to more quickly respond to major customers such as Wal-Mart Stores, Inc., Kmart Corp. and Sears, Roebuck and Co.

But both efforts revolve around one key issue: better data management. The client/server migration will eventually result in an information systems framework that includes a host data server, high-powered HP 1486-based servers and IBM PC clones on the desktop. All corporate data will reside on the HP host, where it will be secured and maintained. Applications will run on servers and PCs.

The new business procedures were designed to make better use of inventory data so the company can ship products more quickly.

The strategy grew out of an observation in the late 1980s: PCs will slowly but surely alter the use of information in the company.

"We started to acquire PCs, 10 here and 15 there," White said. "Pretty soon we were up to 400 PCs. We were losing control of corporate data."

Copies of data were being maintained in departments. So, to answer a question as simple as how many customers Spalding had, the company could come up with "four or five answers," White said.

"Marketing counted one way, credit counted another," White said. "We decided we needed a strategy [for IS] to be the official keeper of the data."

In with the new

That set in motion a plan to move applications off the host systems, which at that time were two HP 3000 Model 950s. The company installed a newer HP Model 992/200 at the end of 1992 to function as the corporate data server. Applications are now being developed to run on PCs and servers. White said the company is about 20% client/server, and it should take several years to complete the switch.

Spalding is writing and licensing applications to run on desktops and access corporate data. In some cases, the software is written from scratch. In other cases, the company is licensing desktop software and then writing interfaces to the host databases.

At the same time, procedures are being redesigned to take advantage of corporate data. Order processing, for instance, was completely revamped.

Previously, factory workers would pick stock on a per-order basis. For example, if Wal-Mart requested 1,000 golf balls, 2,000 tennis balls and 500 basketballs, a picker would go to the warehouse and retrieve those items.

Speedy delivery

Today, orders are generated in bulk for a set period of time, such as hourly intervals. Now a picker goes to the warehouse and retrieves all the golf balls requested for several different customers in a given hour.

The end result is faster order turnaround because pickers are not making several trips for each individual order. The company accomplishes this by maintaining current data in the inventory database on the host, White said.

The host databases are updated by servers every 15 minutes. When a package of golf balls is produced, a bar code is immediately printed on it, and the bar-code data is recorded on the server, which then uploads that information to the host.

White said it will be a long time before all departments are using client/server software and maximizing corporate data. Nonetheless, the time needed to pull this off will be worth it, he added. "We can't just rest on the way we used to do things," he said.

ON SITE

Spalding Sports
Chicopee, Mass.

Challenge: To make better use of corporate data.

Strategy: Move from host-based to client/server architecture; establish host system as data server. Develop new processes and applications that can use corporate data more effectively.

Results: About 20% of operations are client/server. New order-processing techniques make use of inventory database.

STEPHEN SHERMAN

Spalding's Bard White: *Migrating to client/server requires better data management*

Commentary

Jean S. Bozman

Approaching migration

Complexity. Now that client/server applications are a reality, worries about managing the complexity of client/server systems are surfacing among users. But these worries about new computing styles are tempered by the excitement of converting character-based applications into icon-based client/server software.

Several hundred computer professionals who gathered in Philadelphia at the East Coast Oracle Users Conference appeared to welcome the prospect of downsizing aging, monolithic applications that run on mainframes and minicomputers. But many are trying to gauge the pace at which conversion of old systems should take place. Going too fast will cause data management chaos, they said, while going too slowly will leave users way behind the technology curve.

Several practical approaches to client/server migration emerged through user discussions at the conference, including the following:

- **The GUI-first approach:** Many users have started to develop a new generation of client/server applications in stages — converting user screens to a GUI look and feel first, then adapting existing applications to client/server functions over time. Others plan to leave many DOS PCs intact on user desktops and to convert them to Microsoft Windows and client/server functions as needed.
- **The attrition phase-in:** Taking on the entire task at once — as in a wholesale conversion to client/server systems — is viewed by many users as being too expensive. Don't throw the baby out with the bathwater, these users say. Many character-based applications running on hundreds or thousands of dumb terminals at some sites work just fine and have some life left in them. Just phase in client/server systems according to business needs.
- **The no-holds-barred conversion:** This approach takes no prisoners. It accompanies a corporate downsizing plan, which may include the replacement or substitution of an underpowered mainframe with a string of high-powered Unix or PC LAN servers. A development team is detached from regular IS duties to produce a substitute IS system based on relational databases, midrange servers and new client/server application software. Finally, the new system goes into production, and IS managers shut down the aging mainframe.
- **The "show me" strategy, a.k.a. the "I can wait" strategy:** Despite the widespread vendor move to develop and sell client/server products, some users just want to see that it works. These users often monitor the progress of client/server technology by attending conferences but are worried about what some call potential "chaos" in their IS opera-

Bozman, *page 52*

DEC moves to VAX, Alpha mixed clusters

By Melinda-Carol Ballou

In a significant move for its Alpha migration strategy, Digital Equipment Corp. earlier this month released mixed cluster support for VAX and Alpha systems.

The announcement is aimed at users who are eager to test the performance advantages of Alpha by bringing in a few systems gradually, according to analysts and company officials.

The announcement is "probably the most important thing [DEC] could do for their customers this year," said Peter Kastner, a vice president at the Aberdeen Group, a market research firm in Boston.

"It means that those customers can plan to install mixed clusters almost immediately and that their investment in clustering has been protected," he said.

However, users with high availability requirements who run production applications will have to wait until later this year or early next year before layered software ships to support disk volume shadowing and mirroring.

The following types of clustering will be supported:

- Computer Interconnect with a maximum of three DEC 7000/10000s, a total of eight systems and a maximum of two Computer Interconnect controllers and two Star Couplers.
- Digital Storage Systems Interconnect, with a maximum of two DEC 4000 systems on a single bus, can coexist with VAX 4000s, VAX 6000s, VAX 7000s and VAX 10000s but not with MicroVAX 3000s, DEC 7000s/10000s or VAXs using KFQSA controllers.
- Ethernet with up to 12 DEC 3000 satellites and two Ethernet adapters suported within the cluster. DEC 3000, DEC 4000, DEC 7000 and DEC 10000 systems can all act as cluster nodes for the DEC 3000 satellite systems.
- Network Interconnect.
- Mixed Architecture Clusters or Alpha AXP clusters.

The mixed clusters will initially support Fiber Distributed Data Interface (FDDI) via FDDI adapter cards if users have it installed as a network backbone, according to Joe Bates, VMScluster marketing manager at DEC. Direct FDDI support will be available later, he said.

DEC is considering direct support of other non-OpenVMS platforms within the cluster but will base any such decisions on customer demand, Bates added.

Bozman

CONTINUED FROM PAGE 51

tions. Many see database administrators as people who can bring order to client/server by programming the database server to enforce a list of business rules.

Despite initial concerns, many users at the conference said the prospect of shopping for new client/server tools is exhilarating. They can envision aging minicomputer applications being rewritten to run on Unix or PC LAN servers. However, writing client/server programs will clearly require a new mind-set for corporate developers, users said.

The trend toward client/server systems has great momentum, driven by top management's desire to downsize corporations and by IS management's desire to re-engineer applications to run on cheaper platforms. There is no way to hide your head in the sand or pretend you will not participate in the next wave of computing.

The key to making a transition to client/server is realizing there will be a learning curve for programmers, IS managers and even end users. Users should know by now that they must open their appointment books and pencil in the training sessions and conferences they need to attend to improve their client/server skills.

Bozman is *Computerworld*'s West Coast senior editor.

Hospital admits RDBMS

Client/server conversion nears midpoint with patient data system

By Maryfran Johnson
GAINESVILLE, FLA.

■ Building its patient care systems on the backbone of a large database, Shands Hospital at the University of Florida is taking a "low-tech approach" to the high-tech practice of running a health care center.

"We call it low-tech because we swept up all the data we could find in our computer systems and put it in this repository database," said Dr. John Cuddeback, vice president of information services at Shands, the focal point for the University of Florida's College of Medicine.

This approach allows Shands to concentrate on streamlining vast amounts of information without having to replace its paper medical records. Even more importantly, the changes do not demand radical adjustment from users.

In the middle

Nearing the midpoint of a four-year transition to client/server computing, the hospital is building core patient systems and decision support on top of a single Oracle Corp. relational database management system running on an IBM Enterprise System/9000 Model 640, which supports a network of 76 Novell, Inc. servers and more than 2,500 terminals and PCs.

"We have a single production instance of Oracle, used as a data backplane, with everything from clinical data to patient data to cost accounting data to records of how patients move" through the hospital and its multitude of clinics, Cuddeback said. "We're driven by the need to integrate our clinical care, which is what drives the need to integrate the data."

Shands' database is expanding by 7 million laboratory records a year. The growing Oracle clinical database holds about 8G bytes of data, while an older IBM IMS administrative database stores about 35G bytes.

Cuddeback said his vision for Shands' new Hospital Information System (HIS) Version 2 is one that is stripped of technical trappings and eases or eliminates the most miserable aspects of a hospital visit: long waiting hours, lost medical records and misplaced charts.

In the long term, the hospital hopes to wean itself from mainframe dependence, perhaps through the use of multiprocessor "superservers" to consolidate the NetWare servers.

"It's not that we're so happy with the mainframe environment, but we can't quite get where we'd like on another platform yet," said Terry M. Brandt, director of patient systems at Shands. He said he hopes the $4.1 million upgrade last year to the ES/9000 Model 640 is the hospital's last one.

"Our steps are to use Oracle tools on the mainframe, then take the application and make it a client application using the same mainframe server databases during the transition," Brandt explained. "With the application there on the client and the Oracle tools, we're no longer concerned with whether the database is on MVS or a Unix server because we're making generic Oracle calls for data."

By the end of this year, client/server prototypes will be in place for the three most critical applications using the Oracle database: patient registration and tracking, clinic appointment scheduling and the On-Line Outpatient Medical Record (OLMR).

Along with a patient financial management system, those applications make up the core of HIS Version 2, which was launched in June 1991 with the installation of the patient tracking system. The client/server version of HIS Version 2 will roll out during the next two years, replacing 3270 terminals with Microsoft Corp.'s Windows on PCs.

In many ways, the patient tracking application is a mirror of Shands' complexity, Cuddeback noted. It captures data about referring physicians inside and outside the health center and tracks multiple caregivers in multiple roles — in stark contrast to the old system's limitation of indicating only one attending physician.

RANDY BATISTA/SILVER IMAGE

Shands' Dr. John Cuddeback *says he hopes the new system will shorten patients' long waiting hours and eliminate lost medical records*

ON SITE

Shands Hospital
Gainesville, Fla.

Challenge: To provide easier access to data.

Technology: Oracle database.

Status: First production applications now coming on-line.

Money in the pocket

For a nonprofit hospital the size of Shands — which last year earned $18.5 million in revenue over expenses, serving 22,834 in-patients and more than 200,000 outpatients — coordination of services translates to money saved.

The MVS-based clinic appointment scheduling application will address staff downtime by coordinating separate calendars for several clinics and services.

The OLMR application — a kind of one-stop shopping for hospital data on a patient — has been running for a year. One result of OLMR is that doctors no longer have to keep separate charts on patients. They can tap into a terminal or PC to get up-to-date information.

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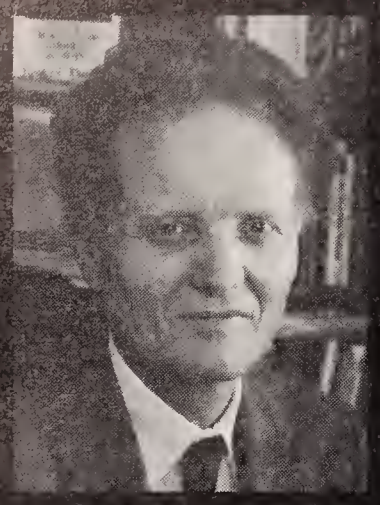

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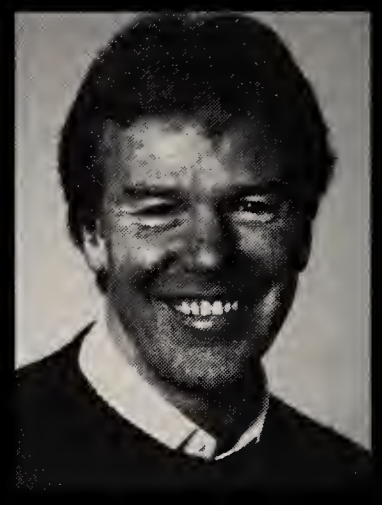

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DG array performs unattended backup

By Melinda-Carol Ballou

Data General Corp. last week announced a high-performance, fail-safe tape array for a range of Unix systems. It can back up a 30G-byte database overnight without operator attendance, company officials said.

"Any enterprise that needs high-availability disks has also got to look at how they're going to manage their backup," said Larry Hemmerich, DG's vice president and general manager of the Clariion business unit.

Dubbed the Series 4000 Tape Array, the product supports up to seven 4mm digital audio tape cartridges to offer as much as 30G bytes of compressed storage. Data striping is supported so that data is delivered in parallel to the array's multiple drives. This allows the Clariion tape array to function up to six times faster than conventional devices, company officials said. It also provides a 20M byte/sec. Small Computer Systems Interface-2 interface between the host system and the tape array to enhance performance, they said.

To offer greater data reliability, parity information is calculated and distributed in the array's data striping process. In this way, operations do not stop if a tape drive or cartridge fails. The parity data is instead stored on the remaining tapes to make it possible to recover data that would otherwise have been lost, company officials added.

Industry analysts spoke well of the new product.

"The key is their performance — being able to back up in a shorter period of time. This is one of the first ones that I know of [for Unix] that does striping in parity and across so many devices," said Fara Yale, an analyst at Dataquest, Inc. in San Jose, Calif.

The product is shipping now for DG's Aviion line and within 90 days for workstations running IBM's AIX, Sun Microsystems, Inc.'s SunOS and Novell, Inc. networks. It is priced at $19,500 with five drives.

New Products

Database management

Softworks, Inc. has announced Version 2.0 of Capacity Plus for DB2 (DCP 2.0).

Features for DCP 2.0 include improved compression estimates, improved Custom Compression, a Speed option and disaster recovery capabilities.

The product is compatible with IBM's MVS, MVS/ESA and MVS/XA operating systems.

License fees start at $16,500.

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Software application packages

WorksRight Software, Inc. has announced the Forms Magic software system for IBM's Application System/400.

According to the company, the product was created for designing and printing graphic-based paper forms. Circles, lines, boxes and graphic-based characters are included and can work together in any combination. More than 40 fonts are also available.

Forms Magic costs $199.

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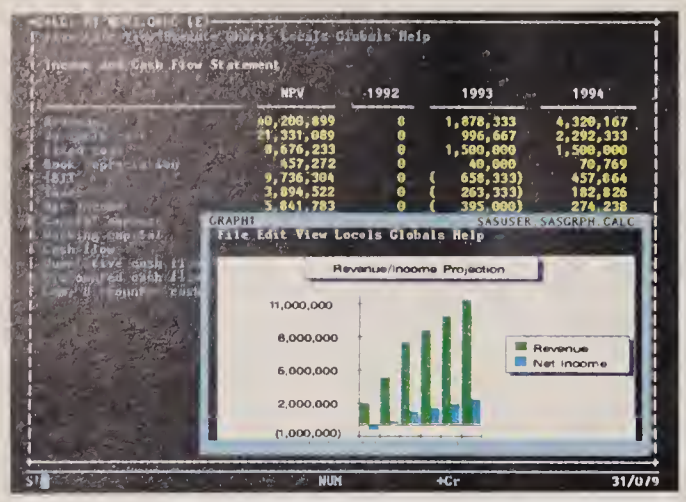

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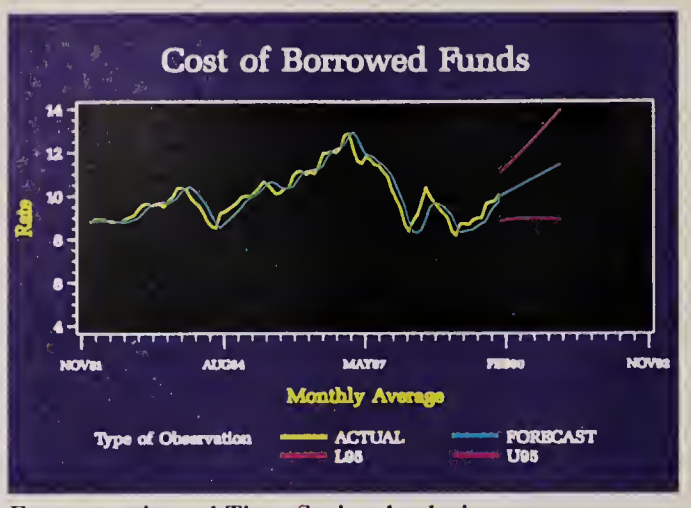
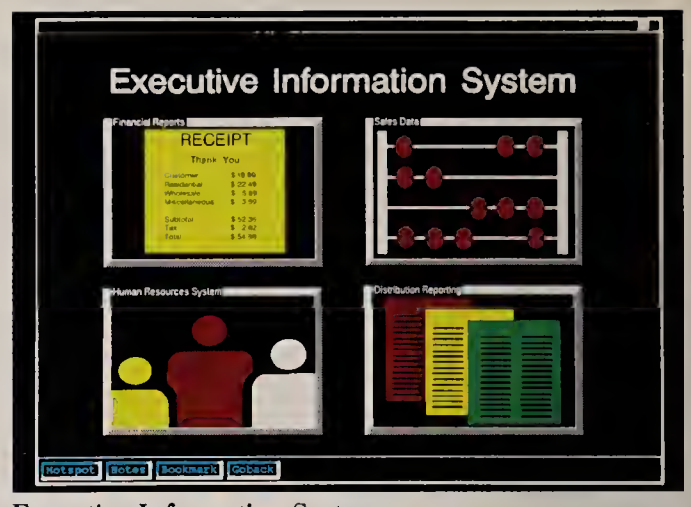
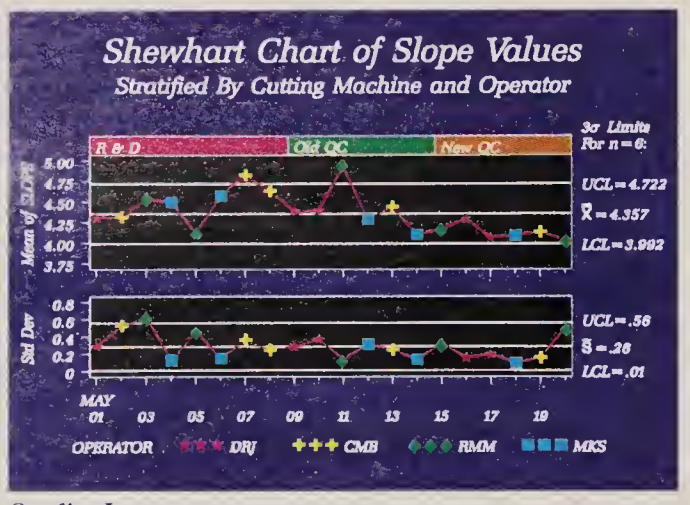


Econometric and Time Series Analysis



Executive Information Systems



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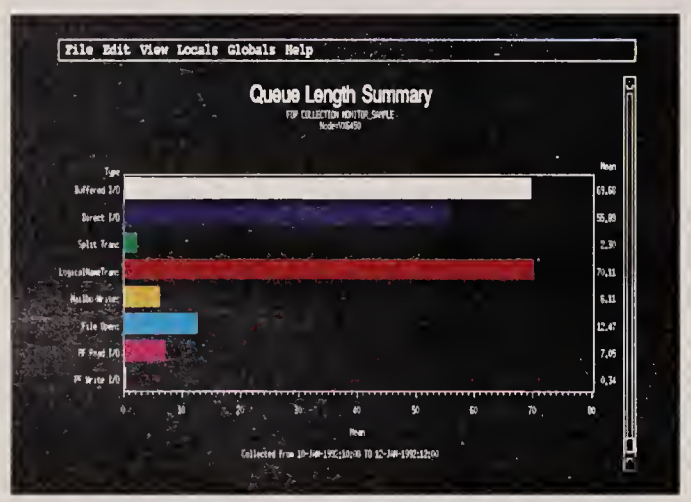

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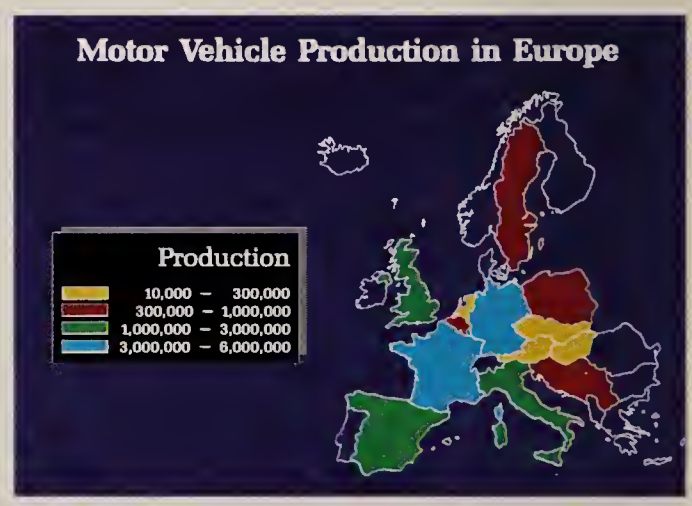
Market Research



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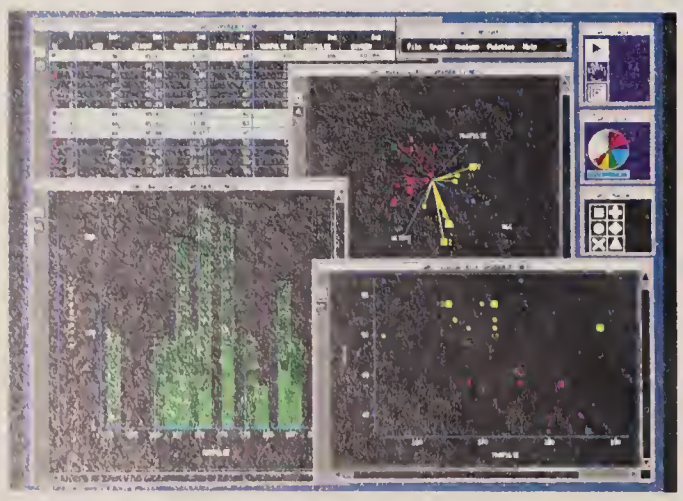
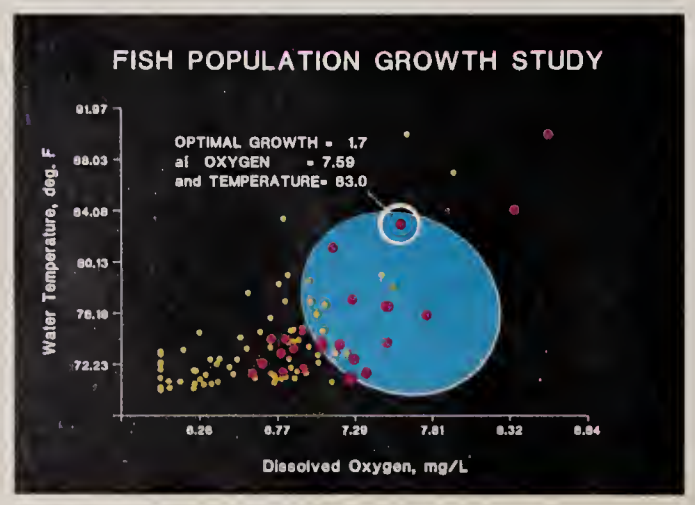
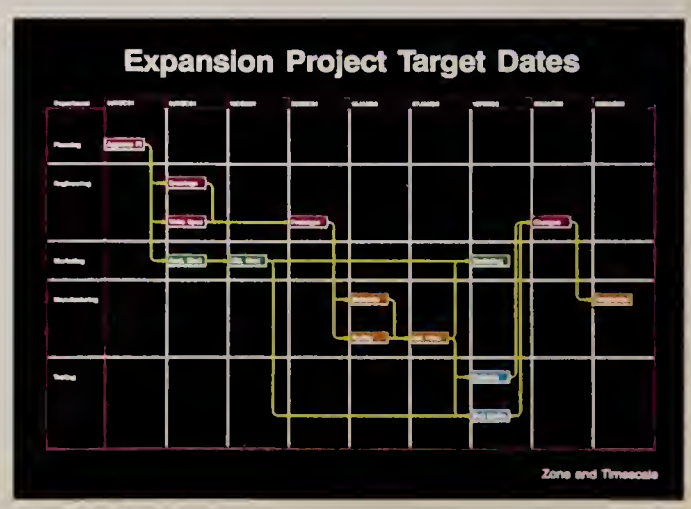


Visualization



Data Analysis



Project Management

Downsizing

Grocer buys into open systems

Associated Grocers uses Unix servers to cut IS costs, boost productivity

ON SITE

Associated Grocers, Inc.
Seattle

Challenge: To control IS costs while positioning the cooperative to take advantage of new information technology.

Technology: Replacing mainframes with networked PCs running Windows and Unix servers running Informix Software's Informix Online.

Goals: Savings on hardware should help cut IS costs from 1% of annual revenue to 0.5%, according to the company.

By Jean S. Bozman
SEATTLE

The grocery business gets by on a razor-thin profit margin. At Associated Grocers, Inc., a $1.2 billion supermarket cooperative, downsizing is being used to keep costs down.

Associated Grocers has a plan to reduce costs through cheaper hardware, but it is still in search of the ideal general-purpose application development tool for open systems.

The firm, a supplier to 350 stores in Oregon, Washington, Alaska and Hawaii, is 18 months into a five-year transition to open systems, said Richard Lester, vice president of information services.

"Cost is a big part of it," Lester said. "But more than anything else, it's the flexibility. Open systems change the cost structure dramatically. We've got to find ways to make better use of computing to take costs out of the pipeline."

Associated Grocers' Richard Lester: *Flexibility is driving force*

Associated Grocers' information systems budget is just under 1% of annual revenue, but Lester would like to halve that percentage. In the process, he plans to re-engineer many of the firm's IBM CICS-based transaction systems, eventually removing the mainframes that host them.

Lower upfront hardware costs, combined with much lower monthly software maintenance costs for small servers than for large mainframes, will have a big impact on the bottom line. At the same time, Associated Grocers expects to gain more productivity in its business by adding new functions to the servers, such as electronic data interchange with suppliers to reduce warehousing of goods.

Until recently, Associated Grocers ran its business on two IBM-compatible Hitachi Data Systems Corp. mainframes. But with the installation of Unix network servers and the shift of application development to desktop PCs, the firm has largely shut down one of the mainframes. "It is there in a standby situation," IS project manager David Okimura said. "It will be fired up if our production system goes down."

As mainframe applications are rewritten for open systems, a swarm of Unix machines have taken on the role of network application servers. So far, these include nine IBM RISC System/6000 machines and two Hewlett-Packard Co. 9000s, most of them stored under desks or in computer room cabinets. A distributed architecture, based on the Open Software Foundation's Distributed Computing Environment standard, links the legacy mainframe systems, the distributed Unix servers and hun-

Grocer, *page 59*

Welcome change

Associated Grocers' programmers are learning to embrace change as they move from Cobol systems to Unix open systems. "The cultural change of going from the comfort of the mainframe environment into a less structured Unix environment is pretty traumatic," said David Okimura, IS project manager.

The brave, new world of client/server computing arrived last June, when support for new development shifted from an IBM-compatible mainframe to desktop Intel Corp. I486 PCs. Associated Grocers' programmers got client/server training, much of it from software tools vendors. But it is up to programmer/analysts like Dragan Jagnjic and John Elliott to bridge the gap between the predictable world of Cobol and the multilingual world of C, SQL and Microsoft's Visual Basic.

Jagnjie said developing one new warehouse management system required all three: Visual Basic for the development of the PC client's user interface, SQL to link clients to the Informix relational database server and C to extend the functionality of Unix tool sets.

Elliott, who used Visual Basic to create client user screens, said he has no problem manipulating screen objects instead of writing procedural Cobol code. But learning how to do it took several months, he said. The changeover to a new programming style has paid off in productivity: He and his co-workers developed 60 client screens in two weeks.

CASE products focus on basics

By Kim S. Nash
SAN FRANCISCO

Yes, computer-aided software engineering (CASE) is still kicking. No, CASE is not as speedy or inexpensive as newer PC-based, object-oriented tools — but the industry is trying its darnedest to get there.

Feeling heat from the likes of **Powersoft Corp.**, **Borland International, Inc.** and **Microsoft Corp.** (which recently announced souped-up C++ compilers), CASE mainstays, including **Intersolv, Inc.** and **KnowledgeWare, Inc.**, promised that some form of object-oriented technology will be added to their workbenches soon.

Although object-oriented technology got a lot of airtime from CASEWorld vendors, most of the products introduced at the show were less cutting-edge than nuts-and-bolts types of tools, such as project management and training tools — decidedly unglamorous but necessary utilities.

Show highlights included the following:

▶**Digital Equipment Corp.** added products to its Cohesion development framework, including DEC Fuse, a Motif-based workbench running on Alpha AXP systems; Rally OpenVMS AXP, a fourth-generation language; and software configuration management tools.

▶Intersolv unveiled new features for a variety of products. For instance, code generator APS can now create IBM OS/2 and Microsoft Windows interfaces, and a Sybase, Inc. version of LAN Repository for IBM's AIX is due out next month.

▶**Oracle Corp.** announced a video-based CASE training product called the Integrated Education Library, which includes videotapes, curriculum guides, computer-based training modules and textbooks. Pricing was not available for the product, which ships in June.

▶**Applied Business Technology Corp.** (ABT) in New York introduced Project Bridge Modeler, a Windows-based project planning tool that models proposed development tasks and links to Project Workbench, ABT's scheduling tool. It costs $1,950 alone or $5,000 with ABT's Application Development Methodology. It is available now.

▶**Evergreen CASE Tools, Inc.**, based in Redmond, Wash., upgraded front-end, PC-based development tool EasyCASE Professional to support an on-line methodology monitor for developers to consult as they work. It costs $795 and will be available in June, the company said.

▶**Unisys Corp.** previewed The LINC Environment, an integrated suite of tools composed of new and existing modules. Unisys moved its mainframe-based analysis and design tools to the PC and created a utility for maintaining mainframe applications on PCs. It is priced at approximately $10,000 and is slated to be available next month.

▶**Verilog, Inc.**, based in France with an office in Dallas, announced the first module in a line designed to address all phases of object-oriented development. Object Editor is a windowing tool to help developers create reusable software modules. It will cost $8,000 per copy and will be available next month. It supports the following platforms: Sun Microsystems, Inc. SPARCstations, Hewlett-Packard Co. 9000 Series 700 and DEC VAXs.

▶**Integrated Computer Solutions, Inc.** in Cambridge, Mass., started shipping ICS Ada Xcessories, a set of products for building Motif-based graphical user interfaces for Ada applications. Priced at $7,615, it supports platforms that run Sun's Solaris operating system.

Better showing

The official tally is not out yet, but CASEWorld attendance was up compared with last year's total of about 8,000, according to Digital Consulting, Inc., the company that puts on the show. However, the numbers are no doubt inflated because Digital Consulting offered free admittance to the product exposition, although not to some of the seminars.

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Grocer moves to open systems

CONTINUED FROM PAGE 57

dreds of IBM-compatible PCs at local stores.

Lester is basing his plans for a plug-and-play, client/server network on the DCE standard, which he said he believes will unify the firm's applications. "DCE has a kind of gravitational force around it," Lester said. "It's kind of like a black hole that's so powerful, it's drawing the vendors to it." Lester sketched out a three-tier architecture based on a presentation layer of Microsoft Corp.'s Windows 3.1 applications, a functional layer of applications running on network servers and a data layer of relational databases stored in servers and legacy data stored in the mainframe.

Tools needed

There is a giant obstacle to creating a plug-and-play open systems network, Lester said: a lack of general-purpose open systems development tools. Associated Grocers' open systems require the creation of custom remote procedure calls to link clients to servers.

"Right now, we're doing everything through brute force," he said, referring to the mixture of tools used to develop links between database servers, legacy data and distributed clients. That means programmers are creating their own middleware for client/server applications, he said.

To create a new open systems architecture, programmers are using Cambridge Technology Group, Inc.'s DCE-compatible tools, the Open Distributed Environment tool set from Open Environment Corp. in Cambridge, Mass., a CTG spin-off. They also use Micro Focus, Inc.'s Micro Focus Cobol and Informix Software, Inc.'s Informix SQL code generator. "The Cambridge tools tie the whole thing together," Lester explained. "They allow you to put things around the network so that you never have to change an application even if those [machines] move around."

That kind of flexibility will prove itself as Associated Grocers' business changes, Lester said. Plug-and-play systems and quick application development will allow the firm to adapt to changing business conditions. A new cross-dock application, for example, will allow groceries to be handed across the loading dock — going directly from the supplier's truck to the store's truck, bypassing Associated Grocers' warehouses. That will help the company reduce costs as it competes with large national rivals such as Minneapolis-based Super Valu Stores, Inc.

Some of Associated Grocers' open systems applications are ready to go into production. A new post-billing system, which will separate the billing process from grocery-handling on-line transaction systems, is set to roll out to the chain's stores this spring. A new warehouse inventory system went into production one year ago. And some things are better off bought: Associated Grocers bought packaged accounting applications from Lawson Associates, Inc. in St. Paul, Minn., Lester said.

In Brief

Cadre to add Rumbaugh

Cadre Technologies, Inc. said it will include the Rumbaugh object modeling technique in its Teamwork application development tool for C++ and Ada programming. The tool currently supports the Shlaer-Mellor object methodology. Cadre also announced that its Ensemble development tool now runs on several Unix workstations, including IBM's RISC System/6000, Hewlett-Packard Co.'s Apollo 9000 Series 700 and Digital Equipment Corp.'s DECsystem and DECstation lines. Ensemble is a six-module product suite for developing, testing and maintaining C programs.

Gateway products unveiled

Sapiens International Corp., an application development company 10%-owned by **IBM**, unveiled gateway products between its back-end code generation tools and front-end analysis and design modules from **KnowledgeWare, Inc.** and **Bachman Information Systems, Inc.**

Intersolv enhances tools

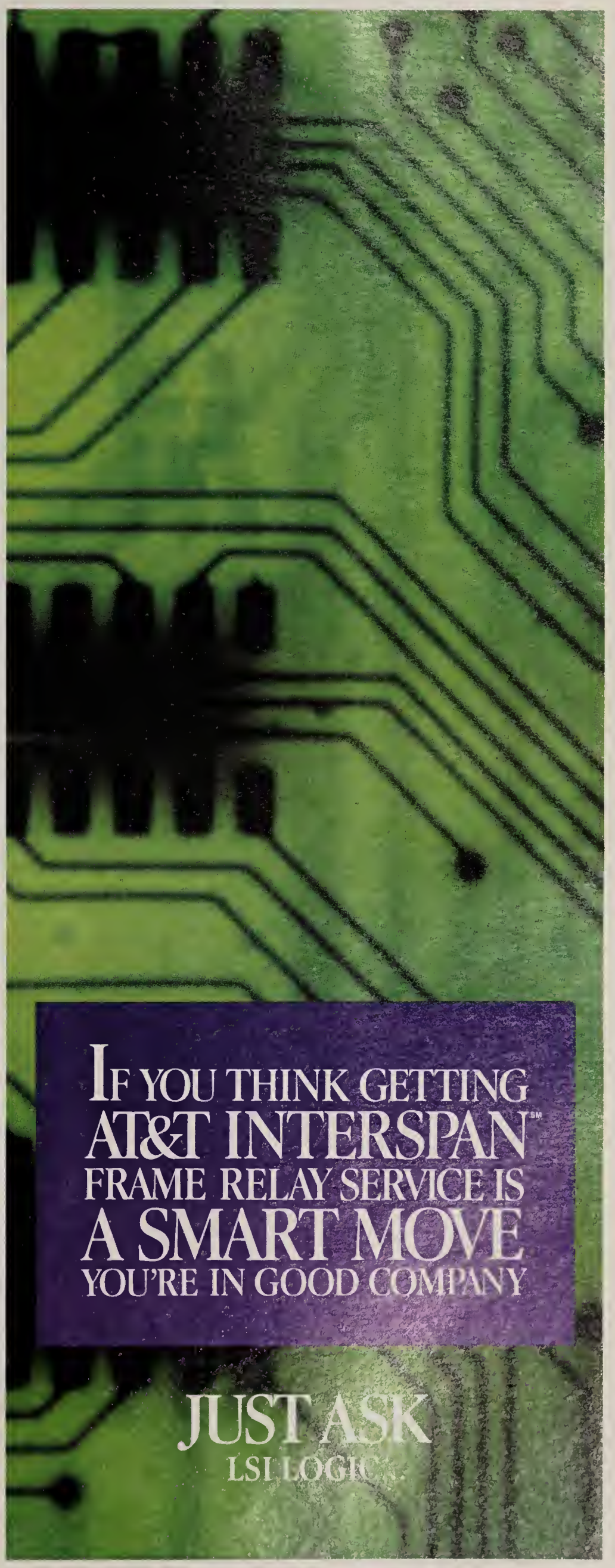
Intersolv, Inc. announced a number of enhancements to its development tools, including the addition of the **James Martin & Co.**'s Information Engineering Methodology to Excelerator II for IBM's OS/2; the generation of Microsoft Corp. Windows and OS/2 client applications from its APS application generator; and a version of the Intersolv LAN Repository for **Sybase, Inc.**'s SQL Server running on the IBM AIX operating system.

CaseSpan updated

InfoSpan Corp., based in Minneapolis, released an updated version of CaseSpan, a repository tool designed to help software programmers migrate from one computer-aided software engineering (CASE) tool to another or pass information among products from different vendors. CaseSpan, which runs on DOS, Windows, OS/2, AIX and SunOS from Sun Microsystems, Inc., supports CASE tools from **KnowledgeWare, Bachman Information Systems, Intersolv, Oracle Corp.** and **Interactive Development Environments, Inc.**

Concurrent licensing

Micro Focus announced that it will begin licensing its Unix software based on concurrent use rather than the combination of machine size and perceived maximum number of users per machine. Under Micro Focus' Unix Concurrent User Licensing, the cost of software is tied to the actual number of users rather than an arbitrary number of perceived users.



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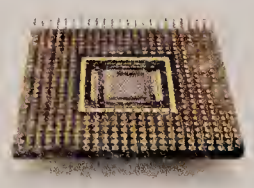

The 64-bit Alpha Chip

Every once in a while, something comes along that lets you do what you used to only dream about. Digital's new Alpha AXP 64-bit technology is all that and more.

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New Products

Cobol compiler helps Unix, Windows coexist

Acucobol, Inc. has taken a big step toward unifying PCs running Microsoft Corp.'s Windows with other platforms: It has provided a runtime version of its Cobol compiler that will allow applications developed on platforms such as Unix or IBM mainframes to be deployed on PCs running Windows.

Acucobol-85 for Windows, currently in beta testing, was designed to leverage the wealth of Cobol programming knowledge at information systems shops without programmers having to recompile applications for a Windows environment.

For example, CF Data Systems, Inc., a Weymouth, Mass., developer of applications for the construction industry, is using a beta-test version of Acucobol-85 for Windows to deploy applications that were developed on Unix systems.

By using Acucobol-85 for Windows, CF Data Systems can allow its programmers to work in the 32-bit preemptive, multitasking Unix environment they prefer, while the applications can be used by users who largely prefer Windows.

"We're a Unix shop, but we're not dumb. Acucobol runtime for Windows lets you redeploy applications without having to go in and rewrite them," said technical director Bill Calahan.

Developers using Acucobol-85 for Windows can customize titles, program icons, place windows and size application screens. In addition, developers can customize it to support any Windows-style features.

Acucobol-85 for Windows costs $225. An Acucobol compiler is priced at $979.

▶ *Acucobol*
Suite 201
7950 Silverton Ave.
San Diego, Calif. 92126
(619) 689-7220

Code libraries

Automation Software Consultants, Inc. has released the Network Basic Library for Novell, Inc.'s NetWare Version 2.0.

The library consists of more than 250 functions designed for writing commercial applications or utility programs for NetWare that require direct access to NetWare services.

The variety of services includes directory and file management, queue management, locking, messages and printing. Almost 50 new functions are introduced in this version, including more NetWare 386-specific features such as file trustees, NetWare 386 rights and encrypted passwords.

Support for Microsoft Corp.'s Quick Basic and Basic is provided.

The product costs $295.

▶ *Automation Software Consultants*
8188 South State Route 48
Maineville, Ohio 45039
(513) 677-0842

Application development tools

Command Technology Corp. has started shipping Version 3.0 of the SPF/PC, a file manager and full-screen text editor.

The product emulates IBM's ISPF/PDF and was designed for users who are making the transition from mainframes to PCs, the company reported.

Version 3.0 of the SPF/PC is compatible with all PC Cobol compilers and provides integration with Micro Focus, Inc.'s Cobol Workbench. Support is provided for count delimited, variable length data records of 32,000 bytes.

The product offers fully mappable keyboard, mouse and color schemes, instant loading of large files and keyboard macros.

SPF/PC Version 3.0 has an introductory price of $199 until May 31. After that the price will be $295.

▶ *Command Technology*
1040 Marina Village Pkwy.
Alameda, Calif. 94501
(510) 521-5900

Watcom has announced Version 9.5 of Watcom C/C++ 32, a multiplatform, 32-bit C/C++ package.

Watcom C/C++ 32 has a high-performance linker that creates executable files in appropriate formats for all supported targets, the company reported. Object code is transported to other industry-standard formats with the product's utilities. The linker performs C++ optimizations, including the elimination of unreferenced virtual functions, and a video debugger uses Novell, Inc.'s NetWare local-area networks and serial and parallel links for cross-platform debugging of applications on remote targets.

Microsoft Corp.'s Windows, Windows NT, Win32s and DOS are supported.

C/C++32 costs $599.

▶ *Wateom*
415 Phillip St.
Waterloo, Ontario
Canada, N2L 3X2
(519) 886-3700

Phar Lap Software, Inc. has introduced Version 5.0 of the 386/DOS-Extender Software Development Kit.

The product was designed for use with Microsoft Corp.'s Windows NT 32-bit C/C++ compiler for 32-bit Extended-DOS development, according to the company.

Users receive the functionality of 16-bit Microsoft C/C++ DOS runtime libraries, including graphics. The 386/DOS-Extender's programs can access up to 4G bytes of all available memory using 32-bit speed and power.

Phar Lap's 386/SRCBug 32-bit source-code debugger is included.

Version 5.0 of the product costs $495.

▶ *Phar Lap Software*
60 Aberdeen Ave.
Cambridge, Mass. 02138
(617) 661-1510

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EFFICIENCY EINSTEINS

Business analysts trained in operations research can be a secret weapon in a CIO's quest for bottom-line results.

Bob Barrett

Sprint's Ron J. Ponder: *Operations research analysts help build 'richer IS solutions'*

By Mitch Betts

Efficiency nuts. Perhaps you've seen one at a cocktail party, explaining that the hostess could disperse that crowd around the popular shrimp dip if she would just divide the dip into three bowls and place them around the room.

As he sketches the improved traffic pattern on the back of a paper napkin, you notice that his favorite word is "optimize"— a surefire sign he has been trained in the little-known fields of "operations research" or "management science."

These folks are driven to solve logistics problems, a trait that may not make them sparkle on the party circuit but may be exactly what today's information systems departments need to deliver more business value.

Experts say smart IS executives will learn to exploit the talents of these mathematical wizards in their quest to boost a company's bottom line.

"If IS departments had more participation from operations research analysts, they would be building much better, richer IS solutions," declares Ron J. Ponder, chief information officer at Sprint Corp. in Kansas City, Mo., and former CIO at Federal Express Corp.

Ponder and others say analysts trained in operations research or management science can turn ordinary information systems into money-saving decision-support systems and are ideally suited to be members of the business process re-engineering team.

"I've always had an operations research department reporting to me, and it's been invaluable. Now I'm building one at Sprint," Ponder says.

As someone who has a Ph.D. in operations research and who built the legendary package-tracking systems at Fedex, Ponder is a true believer in something that many IS professionals have never even heard of.

Mathematical reasoning

So what is operations research? It's the use of advanced analytical techniques (such as mathematical models) to improve or optimize the performance of an organization. Management science is virtually the same, only its papers have a higher ratio of text to equations. Together, they go by the acronym OR/MS.

In either case, OR/MS analysts just love to solve business problems — and the more complex the puzzle, the more they like it. A classic example is the crew-scheduling problem at United Airlines. How do you plan the itineraries of 8,000 pilots and 17,000 flight attendants when there is an astronomical number of combinations of planes, crews and cities?

The analysts at United came up with a client/server-based scheduling system, called Paragon, that seeks to minimize the amount of paid time that crews spend waiting for flights [CW, May 11, 1992].

The Fortran model even factors in constraints such as union rules and Federal Aviation Administration regulations. It is expected to save the airline at least $1 million a year.

Over the years, some of the best CIOs have had operations research backgrounds. For example, Joseph T. Brophy, the award-winning former CIO at The Travelers Corp., previously worked as an operations research mathematician on the Polaris submarine weapons system.

Operations research got its start in World War II, when the military had to make decisions about allocating scarce resources to various military operations. Since then, the analytic sciences have spread throughout business and government, from designing efficient drive-

Efficiency Einsteins, *page 64*

Efficiency Einsteins

CONTINUED FROM PAGE 63

thru window service for Burger King Corp. to ultra-sophisticated computerized stock trading.

Somewhere along the way, perhaps in the 1970s, the operations research and IS disciplines went on separate tracks.

"The IS profession has had less and less contact with the operations research folks . . . and IS lost a powerful intellectual driver," says Peter G. W. Keen, executive director of the International Center for Information Technologies in Washington, D.C.

The split is ironic, considering that one of the first business applications for computers in the 1950s was to solve operations research problems for the petroleum industry. A technique called linear programming was used to figure out how to blend gasoline for the right flash point, the right viscosity and the right octane and in the cheapest possible way.

The 1990s may be an ideal time for the two disciplines to rebuild some bridges, Keen and other observers say. Today's OR/MS professionals are involved in a variety of IS-related fields, including inventory management, electronic data interchange, computer-integrated manufacturing, network management and practical applications of expert systems and neural networks.

Furthermore, each side needs something the other side has. OR/MS analysts need the corporate data to plug into their algorithms, and they need their algorithms plugged into strategic information systems.

Meanwhile, CIOs need to build smart applications that enhance the bottom line and make them heroes with the chief executive officer.

Not people persons

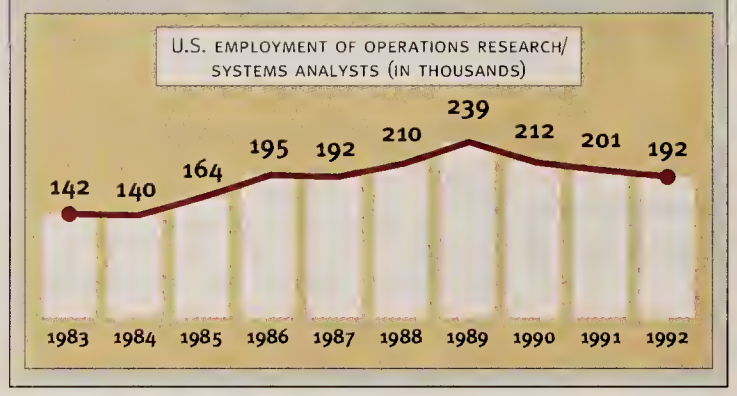
However, Keen says, there are some barriers to collaboration. OR/MS professionals generally lack communication skills and sometimes focus on esoteric mathematics rather than real-world business problems.

"On the other hand, they are very, very bright people. If you can get them away from what I call 'rigor without relevance' and get them onto relevant projects, their rigor is very valuable," Keen says.

Perhaps the biggest barrier is an undercurrent of rivalry between some IS and OR/MS groups as they compete for internal customers, budgets and glory. But failure to cooperate could be suicidal for both professions, experts say.

The recession dip

U.S. employment in operations research and systems analysis rose in the 1980s, but the recession has caused a drop-off in the early 1990s



Source: U.S. Bureau of Labor Statistics — CW Chart: Tom Monahan

At a time when some operations research groups are facing budgets cuts or fading from view altogether, and CIOs are getting fired left and right, it would behoove the two camps to cooperate on some CEO-pleasing "home runs," says consultant Donald B. Brout, president of Quality Technology Decisions, Inc. in New York.

BRITAIN HILL

Joseph Brophy *likes to blow his horn for OR/MS*

"Operations research and management science have a lot to offer the CIO," says Brout, who has a background in both management science and IS. "We can all be heroes."

OR/MS analysts can develop a model of the way a business process works now and simulate how it could work more efficiently in the future, he says. Therefore, it makes sense to have an OR/MS analyst on the interdisciplinary team that tackles business process re-engineering projects.

In essence, OR/MS professionals add more value to the IS infrastructure by building "tools that really help decision-makers analyze complex situations," says Andrew B. Whinston, director of the Center for Information Systems Management at the University of Texas at Austin.

Thomas M. Cook, president of American Airlines Decision Technologies, Inc. in Fort Worth, Texas, puts it in even stronger terms. IS departments typically believe their job is done if they deliver accurate and timely information. But Cook says that adding operations research skills to the team can produce *intelligent* systems that actually recommend *solutions* to business problems.

One of the big success stories at Cook's operations research shop is a "yield management" system, which decides how much to overbook and how to set prices for each seat so that a plane is filled up and profits are maximized.

The yield management system, which deals with more than 250 decision variables, accounts for a whopping 5% of American Airlines' revenue. The airline's Sabre reservation system "got a lot of great press, but the value of things like yield management might even dwarf Sabre's benefits," Brout says.

Where to start

So how can the CIO start down the road toward collaboration with mathematicians?

Brout says that if the company already has a group of OR/MS professionals, the IS department can draw on their expertise as internal consultants. Otherwise, he says, the CIO can simply hire a few OR/MS wizards, throw a problem at them and see what happens.

The payback may come surprisingly fast. As one former OR/MS professional put it: "If I couldn't save my employer the equivalent of my own salary in the first month of the year, then I wouldn't feel like I was doing my job." •

Resources

Operations Research Society of America, Baltimore, (410) 528-4146.

The Institute of Management Sciences, Providence, R.I., (401) 274-2525.

OR/MS Today, Atlanta, (404) 431-0867. A bimonthly magazine ($20/year) for operations research and management science professionals, with articles on practical applications.

Halbrecht & Co., Old Greenwich, Conn., (203) 637-5815. Recruiters in the fields of IS, operations research and management science.

Analytic Recruiting, Inc., New York, (212) 687-9163. Recruiters specializing in operations research.

Home runs in management science

In the last decade, scores of operations research and management science projects have saved companies millions of dollars or have improved government services. Here are some of the "home runs," culled from the book *Excellence in Management Science Practice* (Prentice Hall, 1991).

1981: A computer-aided dispatching system at **Chevron USA** allowed each dispatcher to handle 400 loads per day, compared with the industry average of 150. Running on an IBM 3033, the system could solve a typical dispatching problem in less than a second. Benefit: Chevron cut transportation costs by 3%.

1982: **General Dynamics Corp.**'s Data Systems Division developed a model to help it make an IS capacity planning decision. The model showed that computer throughput would be 23% higher if existing tape drives were replaced with drives that were 60% faster.

1982: The Arizona Department of Transportation developed a decision-support system for allocating maintenance funds to the roughest roads while staying within budget. The system has been adopted by Alaska, Colorado, Kansas, Finland and Saudi Arabia.

1984: The New York City Department of Sanitation used several mathematical techniques to improve the deployment of street cleaners, garbage trucks and inspectors, turning the department's embarrassingly poor performance into a national model. Benefits: Then-Mayor Ed Koch said the streets were much cleaner, and refuse collection productivity increased 17%.

1986: Weyerhaeuser Co. developed an interactive computer model that helps lumberjacks cut each log to maximize profits and minimize waste.

The model considers variables such as the log's length, diameter, curvature, taper and knots. Benefit: The company increased profits by $100 million.

1987: General Motors Corp.'s Delco Electronics Division developed a PC-based planning system to identify the best way to ship 300 types of components to 30 assembly plants. Benefit: GM cut logistics costs by 26%, saving $2.9 million a year. —*Mitch Betts*

Executive Track

Newly on board at the IBM Consulting Group in White Plains, N.Y., is Charles G. Emley Jr. Most recently a management consulting partner at the Los Angeles office of Deloitte & Touche's information technology practice, Emley brings to his new post three decades of experience in the worlds of management consulting and information systems.

At IBM Consulting, where he will hold the title of vice president, he will serve as the North American managing executive for the company's worldwide information technology strategy and planning practice.

Richard Ray has been named vice president and chief financial officer of the Energy Products Unit of Dallas-based steel and oil exploration products manufacturing giant LTV Corp.

Ray, who formerly served as senior vice president of administration at Charter Corp., succeeds LTV Vice President of Finance and IS A. Lee Mulkey, who resigned this year for personal reasons.

At Central Fidelity Banks, Inc. in Richmond, Va., Jay O. Livingston has been promoted from corporate executive officer to corporate executive vice president. In his 19 years at the bank, Livingston has served in a variety of managerial capacities; he is currently group manager of statewide bank services and electronic data processing.

John Fallon, former vice president of decisions support at Hartford, Conn.-based Shawmut Corp., is now executive vice president at Lexington Savings Bank. At his new post, Fallon reports to his former Shawmut colleague and current Lexington Savings President Timothy (Ted) Hansbury.

Glenn Armbruster is the new vice president of materials and logistics management at Dell Computer Corp. A 15-year veteran of Digital Equipment Corp., Armbruster headed up DEC's automotive and general/discrete manufacturing industries business unit prior to joining Austin, Texas-based Dell.

In his new capacity he will be responsible for Dell's worldwide logistics, quality, operations information services, business planning and inventory and materials management.

Intelligence Files

Ergo-neglect

The vast majority of corporations have done little to address the ergonomics problems associated with VDT work, according to a survey by The Joyce Institute, a consulting firm based in Seattle.

Only 8% of the companies surveyed had a corporatewide program to redesign VDT jobs to reduce stress, for example, and only 15% had a full-scale VDT ergonomics training program.

The attention given to VDT ergonomics seems to be spotty. For example, although only 8% had addressed the problem of VDT glare on a corporatewide basis, 89% of the companies had addressed it in "some areas."

The good news is that more corporations said they will take action in 1993. The survey found that 57% of the companies plan to work on VDT training and glare issues this year, for example.

Source: The Joyce Institute, Seattle.

GIS in banking

Federal regulations may be a driving force in the adoption of geographic information systems (GIS) in the banking industry.

Under the Financial Institutions Reform, Recovery and Enforcement Act of 1989, regulators are asking for more data that proves that banks and thrifts are meeting the credit needs of their communities.

That means banks must delineate their market areas and provide a breakdown of their loan portfolio per census tract. GIS technology can help banks comply with the regulations by identifying low-income and minority-dominated census tracts and then showing the bank's lending patterns in those areas.

Source: "GIS eases banking's regulatory compliance efforts," by Al Tavakoli, *GIS World*, January/February 1993.

PC buyers' blues

A survey of 1,000 people who recently bought PCs found that they wished they had selected more powerful features at the outset so they could handle future applications.

Some examples follow:

- 62% wanted more expansion slots than they had received.
- 48% felt they should have bought a better quality monitor.
- 47% have found a need to install more random-access memory.
- 39% complained that they had not bought a large enough hard drive.
- 36% desired an additional floppy drive.

Source: Channel Marketing Corp., Dallas.

Calendar

MARCH 28-APRIL 3

Organizational Computing, Coordination and Collaboration Conference. Austin, Texas, March 28-30 — Contact: The University of Texas at Austin (512) 478-4081.

Voice '93 Spring Conference and Exposition. San Diego, March 30-April 1. — Contact: Linda Wilson, Voice Processing Magazine, Houston, Texas (713) 974-6637.

14th Annual IS Performance/Capacity Management Conference. Scottsdale, Ariz., March 30-April 2 — Contact: The Institute for Computer Capacity Management, Phoenix, Ariz. (602) 997-7374.

JAD/CASE Conference. Washington, D.C., March 31-April 2 — Contact: ATLIS Performance Resources, Inc., Rockville, Md. (301) 770-3000, ext. 305.

Wireless/PCs Fifth Annual Conference. Washington, D.C., March 31-April 2 — Contact: Telecommunications Reports, Washington, D.C. (202) 842-3022.

Client/server and Distributed Computing: Designing the Application. Washington, D.C., April 1-2 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

APRIL 4-APRIL 10

Apple Enterprise Computing Conference. San Francisco, April 5-7 — Contact: Apple Enterprise Computing Conference, Mountain View, Calif. (415) 966-8978.

Communications Tokyo '93. Tokyo, April 5-8 — Contact: Ron Atkins, E. J. Krause & Associates, Inc., Bethesda, Md. (301) 986-4538.

Data Warehouse '93. Washington, D.C., April 5-8 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

APRIL 11-APRIL 17

Software Performance Engineering. Santa Fe, N.M., April 13-16 — Contact: L&S Computer Technology, Inc., Austin, Texas (505) 988-3811.

Electronic Data Interchange. San Antonio, April 14-16 — Contact: Data Interchange Standards Association, Alexandria, Va. (703) 548-7005.

International Conference and Exhibition on Multichip Modules. Denver, April 14-16 — International Society for Hybrid MicroElectronics, Reston, Va. (703) 471-0066.

Society for Information Management 1993 Institutional Member Conference. Rancho Mirage, Calif., April 14-16 — Contact: Society for Information Management, Chicago, Ill. (312) 644-6610.

APRIL 18-APRIL 24

The Fifth Annual Data Administration Management Association (DAMA) International Symposium. Boston, April 18-21 — Contact: DAMA, International Symposium, Boston, Mass. (508) 967-7132.

Supercomm '93. Atlanta, April 19-22 — Contact: Telecommunications Industry Association, Washington, D.C. (202) 457-4912.

Patricia Seybold Group Spring 1993 Conference. Boston, April 18-23 — Contact: Deborah Hay, Patricia Seybold Group, Boston, Mass. (617) 742-5200.

APRIL 25-MAY 1

Xplor International's Vendor Interaction Symposium Information Opportunity Networking (VISION) '93. Denver, April 25-28 — Contact: Xplor International, Palos Verdes, Calif. (310) 373-3633.

The Softool User Group. Santa Barbara, Calif., April 26-28 — Contact: Softool Corp., Goleta, Calif. (805) 683-5777.

National Computer Graphics Association (NCGA). Philadelphia, April 26-29 Contact: NCGA, Fairfax, Va. (703) 698-9600.

Distribution/Computer Expo '93 — Exhibit and Seminar. Chicago, April 27-29 — Contact: C. S. Report, Inc., Uwchland, Pa. (215) 458-8926.

Incotek '93. Warsaw, April 27-30 — Contact: Global Technologies, Inc., Washington, D.C. (202) 797-3782.

MAY 2-MAY 8

The Workflow Conference on Business Technology. Boston, May 3-5 — Contact: The Workflow Institute, Alameda, Calif. (510) 769-9627.

LotusWorld '93. Boston, May 3-6 — Contact: Danieli & Keefe Associates, Sudbury, Mass. (508) 443-3330.

James Martin World Seminar. Boston, May 3-7 — Contact: Extended Intelligence, Inc., Chicago, Ill. (312) 346-7090.

DB/Expo '93. San Francisco, May 3-7 — Contact: NDN Enterprises, Inc., Mountain View, Calif. (415) 966-8440.

Dev Con '93. Costa Mesa, Calif., May 4-6 — Contact: Franson, Hagerty & Associates, San Jose, Calif. (408) 453-5220.

The National On-line Meeting. New York, May 4-6 — Contact: Carol Nixon, Learned Information, Inc., Medford, N.J. (609) 654-6266.

Unix Reseller Show and Conference. Dallas, May 4-6 — Contact: Expoconsul International, Inc., Princeton, N.J. (609) 987-9400.

Process for Using Quantitative Data to Manage Information Technology Projects and Activities. San Diego, May 6-7 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

MAY 9-MAY 15

Advanced Topics in DB2. Toronto, May 10-12 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Systems Support Expo. Boston, May 11-12 — Contact: Bill Springer, United Publications, Inc., Yarmouth, Maine (207) 846-0600.

UCLA Information Systems Associates Symposium. Los Angeles, May 12 — Contact: Ginny Hyatt, University of California at Los Angeles (310) 825-1879.

Independent Computer Consultants Association Conference. Tarrytown, N.Y., May 13-16 — Contact: Independent Computer Consultants Association, St. Louis, Mo. (314) 997-4633.

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The CW Guide to Servers

Not just any server will do

THE FASTEST MACHINE MAY NOT BE THE ONE FOR YOUR COMPANY. READ WHY.

A lot has changed in servers. It's true many machines that fall into this rather large category have gotten faster, more robust and more functional, but no longer do speeds and feeds cut it. The appropriate application server for your business has to do a lot more.

The optimal server for your mission-eritical produetion applications may very well *not* be the one that screamed through benchmark tests. If you're running Oracle over a Transmission Control Protoeol/Internet Protoeol network, for instanee, you will want something different than if you are running Sybase over Novell, Inc.'s NetWare. The optimal server is defined by its use.

In the past, when "server" usually meant "file server," systems managers were mainly concerned with memory, storage and speed. Today, with rampant rightsizing and downsizing, servers are inereasingly employed for heavy-duty database serving, running production applications, human resources and inventory. Aecordingly, managers are concerned with how the server handles bottlenecks, how large it can seale, how manageable it is and what reliability features it has.

As you can see, we're not talking about $2,000 maehines here. Single-processor PCs and workstations top out at 32M bytes — just enough memory to run a produetion application that isn't going to keep growing, whieh is unlikely. These machines also tend to laek the reliability, manageability and sealability features that managers seek in a database server, although they are fine for file serving **(see story page 71)**.

This also doesn't tend to inelude the on-line transaction processing servers sueh as those from Pyramid Technology Corp., Sequent Computer Systems, Ine. and Tandem Computers, Inc. These maehines offer great sealability through multiple proeessors, but they tend to be architected like a minicomputer; that is, the operating system and database are eonfigured for dumb terminals to send short transaetions via a limited number of protoeols. Under eertain conditions, however, they ean do the job **(see story page 71)**.

Database servers need to run a relational database that can support a mix of transaction processing and decision support. This includes superservers, the rather vague category of "multiproeessor servers" (ineluding those from NCR Corp. and Wyse Teehnology, Ine.) and reduced instruetion set eomputing (RISC) servers designed speeifieally to handle serious produetion applications. **(For user satisfaction ratings, see Buyers' Scorecard on page 70.)**

Strictly speaking, superservers are Intel Corp.-based machines that support multiple proeessors, have proprietary internal buses and sport high-availability and systems management features **(see story page 76)**. These include IBM's Personal System/2 Model 295, Compaq Computer Corp.'s SystemPro and models from NetFrame Systems, Inc. and Tricord Systems, Inc.

The platform you opt for will likely be based on your systems philosophy and previous experience. In many eases, it ean also be determined by whether you're an upsizer or a downsizer. The group you're in tends to determine which track you take. Upsizers tend to opt for Intel-based maehines, while downsizers have a pattern of going to RISC **(see story page 69)**.

Of course, not even that rule is firm; there are always exeeptions. The Intel and RISC traeks are also merging. Superservers and high-end PCs can run Unix in the form of Novell's UnixWare, Solaris from SunConnect, a division of Sun Microsystems, Ine., and The Santa Cruz Operation's Open Desktop. Likewise, NetWare is likely to soon move onto the RISC platform.

If Microsoft Corp.'s Windows NT proves its worth as a platform, superservers could take a quantum leap forward. Also, multiple high-performance processors are giving both platforms stunning performanee, blurring the distinctions in speed **(see story page 72)**.

All of this means the choice of a server will increasingly come down to vendor support, reliability, manageability, price and scalability. It is only then that speed becomes important. For the latest benehmarks on the market-leading servers in each category, refer to our Lab Report charts. •

Alan Radding is a free-lance writer in Newton, Mass.

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Servers

Downsizers vs. upsizers

Your orientation determines your need for manageability, support and price

By Alan Radding

The search for a server to run heavy-duty production applications often ends with the purchase of a reduced instruction set computing (RISC)-based machine, a superserver or a multiprocessor machine such as those from NCR Corp. or Wyse Technology, Inc.

While the dark horse in the group has traditionally been the superserver class, these Intel Corp.-based machines are increasingly taking on characteristics usually seen only in the RISC world, such as high-availability features, management capabilities and scalability.

Still, people coming from an information systems orientation seem to shy away from these machines, often opting instead for the more familiar world of the traditional systems vendors such as IBM, Digital Equipment Corp. and Hewlett-Packard Co. This group is usually downsizing from mainframes and wants to retain that level of control.

"If you are taking a top-down approach, then you have people who are used to high levels of control and support," says Lynn Berg, program director of midrange computing strategies at Gartner Group, Inc.

On the other hand, if the organization is following a "bottoms-up strategy where PCs grew into LANs and now are taking on production applications, it will prefer the PC vendors," Berg continues. These users have never experienced control available in the proprietary host environment.

Management in a PC

Although they don't have the manageability of a mainframe or minicomputer, PC superservers such as Compaq Computer Corp.'s SystemPro, IBM's Personal System/2 Model 295 and models from NetFrame Systems, Inc. and Tricord Systems, Inc. bring inner diagnostics to the PC server.

"These machines generate a lot of information," says Leo Spiegel, executive vice president/chief technology officer at LANsystems, Inc., a New York systems integrator. "It saves you from having to guess where the problem might be."

Superservers basically offer three management features in the form of a plug-in board:

- Provide a full set of statistics on what's happening with the system in real time, in areas such as memory, the drive or the Ethernet card.
- Keep a history of system events.
- Anticipate problems based on statistics and trigger alerts. Some can automatically dial a modem.

Of all the superservers, IBM's offers the most comprehensive set of management features and is the easiest to use. Of course, it is also considered the most complex of the superservers as well.

But while organizations downsizing from a host environment seek as much management capability as they can get, those upsizing from the PC environment take a more laissez-faire approach.

"I'd like to think we'd use management features, but that hasn't been our experience," says Tom Bernhardt, technology specialist at Star Enterprise, a petroleum products refiner in Austin, Texas. The organization uses standard 486-based Extended Industry Standard Architecture servers from Dell Computer Corp. but is shopping for a superserver in preparation for running database applications under Microsoft Corp.'s Windows NT.

The diagnostics on superservers are typically available through a plug-in board. By contrast, the RISC system vendors typically offer this capability through a software layer, says John Turner, major account manager at systems integrator ISYX LAN Systems, Inc. in Rockville, Md. Some people feel the hardware approach makes the machine more in touch with itself, while the software approach is more flexible.

Companies upsizing from PC environments are also intrigued by the fact that they don't have to leave the familiar Novell, Inc. NetWare environment. Hospital Staffing Services, Inc. in Fort Lauderdale, Fla., exemplifies the bottoms-up track. It went through a series of Compaq 386-based servers until it finally jumped to a Tricord server when it acquired another company. Like many upsizing firms, Hospital Staffing Services liked the fact that Tricord ran NetWare v3.11 in native mode.

As yet, NetWare does not run natively on RISC/Unix, although Novell is involved with both HP and Sun Microsystems, Inc. to port to their RISC/Unix platforms. No timetable has been announced.

Unlike high-end PCs, superservers offer high-availability features such as a dual Small Computer Systems Interface controller, mirrored storage (see story page 76) and dedicated I/O processors to reduce I/O bottleneck, says Scott Koegler, manager of IS at Hospital Staffing Services. Superservers still have gaps though, one of which is relational database management system performance.

Brewer's Retail, Inc., a beer distributor in Mississauga, Ontario, that recently downsized from an IBM mainframe, chose Sun 630 MP and 670 MP servers to run a variety of client/server applications built with Uniface Corp.'s Uniface and a Sybase, Inc. database.

RDBMS support

Downsizing organizations tend to opt for the RISC/Unix servers on the basis of their support for the popular networked RDBMS, such as those from Oracle Corp., Sybase, The ASK Group, Inc.'s Ingres Products Division and Informix Corp. These networked databases are basically designed to run on RISC platforms. "When you get to RDBMS performance, people jump to RISC," says Brad Day, principal analyst in the client/server technologies group at Dataquest, Inc. in Framingham, Mass.

Downsizers/Upsizers, *page 71*

LAB REPORT

RISC SERVERS

	Khornerstone rating	OLTP Rating 1	OLTP Rating 2	Multitasking rating
HP 9000/735	189,845	—	41.38	—
IBM RS/6000/220	—	—	—	—
IBM RS/6000/350	92,368	145.75	—	13.890
Silicon Graphics 4D/220 GTX	35,738	24.94	—	12.440

The Khornerstone rating represents an overall computer performance. OLTP ratings are transaction processing benchmarks; Rating 2 uses larger files then Rating 1. The multitasking benchmark measures the total time to execute 10 simulated tasks using large data files. Ratings not present means that benchmark was not performed on that system.
Servers listed are the latest tested by ARS/Workstation Labs.

Source: ARS/Workstation Labs

Waiting for NT

Like characters in Samuel Becket's *Waiting for Godot*, vendors are jockeying for position as they wait for Microsoft's Windows NT. The new operating system promises to have everything users and developers want in an operating system for an application server, plus all the benefits of Unix and PC compatibility. DEC, Tricord, NetFrame and Sequent are already talking about NT servers. But who knows when NT will finally start shipping, exactly what it will be like and how it will perform?

Server shopping list

According to Brad Day, head of the client/server technologies group at Dataquest, Inc. in Framingham, Mass., astute buyers will soon be measuring their application server vendors against the following decision-making criteria:

- **Architecture.** How robust and flexible is it?
- **Operating environment.** Does it run all the operating environments that support current and future application requirements?
- **Linear scalability.** As you add processors or increase I/O, does the system's performance scale well for complex, multiuser needs?
- **Communications.** Does the platform support all necessary LAN protocols as well as WAN connectivity and integrated needs to operate efficiently within current LAN installations, as well as ease the initial downsizing of applications off the mainframe?
- **Service and support.** When there are hardware and software problems, can users call on one experienced vendor — a single point of contact — and what level of response time will be guaranteed?
- **Product superiority.** What does the future hold for this product during the next five years that will make users feel comfortable that this architecture will continue to give their technology installation a competitive edge?

LAB REPORT

MULTIPROCESSOR SERVERS

	Khornerstone rating	OLTP Rating 1	OLTP Rating 2	Multitasking rating
NCR 3445	53,926	23.75	21.05	25.2
Sun 630MP	43,417	—	32.08	77.690
Wyse 7000/740MP	42,901	—	37.15	—
Altos 4500	22,850	34.92	23.21	15.74
ALR MultiAccess 3000	12,555	23.47	—	25.280

The Khornerstone rating represents an overall computer performance. OLTP ratings are transaction processing benchmarks; Rating 2 uses larger files then Rating 1. The multitasking benchmark measures the total time to execute 10 simulated tasks using large data files. Ratings not present means that benchmark was not performed on that system.
Servers listed are the latest tested by ARS/Workstation Labs.

Source: ARS/Workstation Labs

Servers

COMPUTERWORLD BUYERS' SCORECARD

Buyers' Scorecard: DG's Aviion leads the pack in RISC server market

By Derek Slater

Reduced instruction set computing (RISC) servers are offered by an increasing number of vendors. However, the major workstation vendors still hold the lion's share of the RISC server market.

Data General Corp.'s Aviion users were most satisfied with their servers. Aviion took the highest overall score of 87, well ahead of second-place finisher Hewlett-Packard Co.'s HP 9000 Series 800 servers at 82.

Digital Equipment Corp.'s DECsystem servers placed third with a score of 81. Sun Microsystems, Inc.'s SPARCserver 10 and IBM's RISC System/6000 Powerservers rounded out the survey.

DG's Aviion servers include from one to four Motorola, Inc. 88100 processors. As with the other products in the survey, the response base included users of both high- and low-end models.

The Unix-based Aviion workstation and server products play an ever more important role for DG as users move away from the company's proprietary MV minicomputer line. DG's revenue from Aviion products recently surpassed MV systems revenue for the first time.

The DG servers earned the highest score in value for the dollar, and a number of users said price/performance is the Aviion line's greatest strength. Pricing starts at just less than $20,000, while high-end multiprocessor models cost more than $100,000.

RISC servers

Data General's Aviion — SCORE 87

Hewlett-Packard's HP 9000 Series 800 — SCORE 82

DEC's DECsystem 5000 — SCORE 81

Sun's SPARCserver 10 — SCORE 79

IBM's RS/6000 Powerserver — SCORE 77

Users also gave DG's servers top marks for the functionality of their Unix variant operating system, DG-UX. However, the dearth of third-party applications that run under DG-UX proved to be a liability, users said.

HP got an early jump on the RISC market and holds a commanding lead in installed multiuser RISC systems, according to Computer Intelligence/Infocorp. However, Sun currently owns a higher percentage of total RISC systems shipped each quarter.

The 9000 Series 800 servers include a variety of models based on HP's Precision Architecture-RISC processor. The entry-level F10 model, with a 32-MHz processor, costs just over $11,000. At the other end of the line, the I50 model runs at 96 MHz and accommodates 768M bytes of memory.

Respondents gave HP high satisfaction ratings in a number of categories, including value for the dollar and overall speed.

DEC's DECsystem servers are based on Mips Technologies, Inc. RISC processors, with pricing ranging from $13,000 to $53,000. DEC's products scored high in compatibility and quality of service and support but lagged behind in overall speed and value for the dollar.

Sun's SPARCserver 10 line includes four models. These models have either one, two or four SuperSPARC RISC processors from Texas Instruments, Inc.

Pricing for the SPARCserver 10s runs from approximately $17,000 to about $55,000, which analysts characterize as relatively high for the performance offered. Users rated the products fairly low in value for the dollar. Sun's product garnered praise for the functionality of its Solaris operating system, but it also earned low ratings in service and support.

Like HP, IBM's RS/6000 line offers a broad range of servers. The low-end model, the Powerserver 220, costs less than $7,000; the high-end Powerserver 970 costs more than $90,000 and has capacities of up to 512M bytes of memory and 20.6G bytes of internal disk space. All models are built around a single IBM Power RISC processor running at clock speeds of 20 MHz to 50 MHz.

Though the line starts at a lower price point than the other products in the survey, IBM users gave their systems a relatively low rating in value for the dollar.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on satisfaction with their RISC-based servers in 15 categories.

All categories were factored into the final scores. The scores for each product in the six most important categories are listed in the charts below. (See the methodology on the following page for a description of the scoring process.) •

Ratings in order of importance

8.9	Value for the dollar
8.8	Compatibility with installed equipment
8.5	Overall processing speed
8.5	System availability/ reliability
8.4	Disk storage capacity
8.3	Memory capacity
8.3	Quality of vendor support
8.2	Responsiveness of vendor service
8.0	Functionality of operating system
8.0	Upgradability
7.9	Availability of spare components
7.9	Configurability
7.6	Ease of installation
7.5	Documentation

Vital statistics

Respondents reported the following responsibilities for RISC-based servers:

RESPONSE BASE: 185 USERS

Evaluate or recommend vendors	156
Determine need	149
Set standards for organization	133
Select vendors	131
Buy for user departments	93

(MULTIPLE RESPONSES ALLOWED)

Ratings are based on a 1-to-10 scale, where 10 is best.

Reasons are based on the most frequently stated answers.

Data General's Aviion

RESPONSE BASE: 20 USERS

9.5	Sufficient disk storage capacity
9.1	Compatibility with installed equipment
8.9	Value for the dollar
8.9	Sufficient memory capacity
8.9	Speed
8.5	Reliability

Would you buy the product again?

LIKELY — REASON: Good price/ performance (19) — DON'T KNOW (1)

Hewlett-Packard's HP 9000 Series 800

RESPONSE BASE: 27 USERS

8.5	Sufficient memory capacity
8.5	Value for the dollar
8.5	Speed
8.5	Reliability
8.4	Compatibility with installed equipment
8.2	Sufficient disk storage capacity

Would you buy the product again?

LIKELY — REASON: Good price/ performance (22) — UNLIKELY — REASON: Operating system (5)

DEC's DECsystem 5000

RESPONSE BASE: 39 USERS

9.0	Sufficient memory capacity
8.9	Sufficient disk storage capacity
8.8	Compatibility with installed equipment
8.6	Reliability
8.1	Value for the dollar
8.0	Speed

Would you buy the product again?

LIKELY — REASON: Meets our needs (30) — UNLIKELY — REASON: Better products available (9)

How big is big?

A number of vendors make servers that might be better regarded as Unix multiuser hosts. These machines from vendors such as Sequent, Sequoia Systems, Inc., Pyramid Technology Corp. and Tandem Computers, Inc. sport multiple processors and support dozens and even hundreds of users. In many cases, they are delivering parallel processing, not SMP, as the RISC servers provide. This means they can scale much higher than an SMP-based machine. Generally, these machines support users on dumb terminals and RISC servers. The biggest servers typically provide traditional proprietary host features in a box packed with Intel processors. They often are optimized for on-line transaction processing and architected and configured to provide true fault tolerance. Typical applications include bank transactions and airline reservation systems. The appeal is mainframe power at a substantially lower cost.

Downsizers/Upsizers

CONTINUED FROM PAGE 69

Superservers also don't have a long history of proven support. Consulting and systems integration are typically handled by the value-added reseller that makes the sale and does the installation.

In a survey of several hundred client/server system buyers, Dataquest's Day found purchasers insisting that the vendor offer consulting, systems integration and other levels of support (see box page 69).

That explains why RISC vendors DEC and HP showed up well in the study. The multiprocessing machine vendors such as NCR and Wyse also do well here. Such support is typically negotiated and priced separately from the system.

Many levels of support

The support that's available comes in many forms. When Investco Funds Group in Denver left two proprietary Data General Corp. MVS 10000 hosts for the new world of local-area network-based client/server computing, it opted for the NCR 3600 because of the scalability of the system and NCR's high-level support.

"With things changing so fast in this business, you can never know enough, but NCR brought a wealth of resources to us," says David Barrett, vice president of information technology at Investco, a rapidly growing mutual fund company.

Oklahoma City-based Liberty Bancorp went so far as to turn the server vendor into a key player in a three-party alliance involving the bank, the server vendor and its banking software developer. The bank is rearchitecting its entire systems and network infrastructure as it moves from a centralized host to a three-tier client/server strategy, and it has selected HP servers as the middle tier of its strategy.

Something that's potentially misleading about superservers and RISC workstations, for that matter, is that you may end up spending close to low-end mainframe levels on the initial hardware purchase. Despite the use of low-cost PC and RISC technology, when you factor in the cost of sophisticated high-availability components (such as redundant arrays of inexpensive disks storage, mirrored or duplexed storage, other redundant components and multiple processors), these machines are not cheap.

Entry-level prices for stripped-down superservers may range from $12,000 to $20,000, but serious production application servers configured with enough memory and storage typically fall into the $60,000 to $120,000 price range, LANsystems' Spiegel says. A fully configured superserver with multiple processors can cost as much as $750,000 — more than a small mainframe. Depending on configuration and the number of processors, RISC servers can run from the high $20,000s up to $150,000. At the same time, you get 15% to 20% more bang for the buck each year.

Users recommend a minimum of 32M bytes of memory and a gigabyte of storage for starters. For a Compaq SystemPro with 4G bytes of storage, 64M bytes of main memory and a 250-user NetWare license, Midland Life Insurance Co. in Columbus, Ohio, pays about $30,000 and considers it a bargain. •

How low can you go?

With the Intel Corp. 1486 processor, even a standard PC has the power to perform database serving on a small scale. Vendors such as AST Research, Inc., Advanced Logic Research, Inc., Dell Computer Corp., Compaq Computer Corp., IBM and others are turning out well-engineered, powerful, low-cost 486-based PCs that can be adopted for database serving.

When Pentium, the next-generation Intel processor, arrives, it will dramatically increase the processing power of the Intel platform, but it won't do much when the bottleneck is something other than the processing power of the CPU. In fact, it may exacerbate the situation as the superfast processor twiddles its thumbs waiting for data to cross the I/O subsystem.

There are several drawbacks to PCs for anything but entry-level application serving:

- They typically top out in terms of memory and storage where you want your application server to start: at 32M bytes of memory and 1G byte of storage.
- They lack the internal diagnostics of the superservers.
- They lack an internal architecture designed specifically to support high levels of I/O.
- They lack multiprocessing, symmetrical or otherwise.

While PCs have some high-availability features, such as error-correcting memory, they do not support redundancy from the CPU to the disk. But if the database and application is small and there are only a few users (and you can sleep at night without the high-availability features), these machines can work. And when the application invariably grows, it is an easy hop to a PC superserver. —*Alan Radding*

LAB REPORT

INTEL SERVERS

	Khornerstone rating	OLTP Rating 1	OLTP Rating 2	Multitasking rating
AT&T StarServers	24,091	29.66	30.82	30.820
Microway B3 486/50	22,981	—	18.89	21.510
Compaq SystemPro 486	15,327	20.19	15.71	17.120
Northgate 433EISA	13,469	—	10.38	15.900
ALR VEISA	12,385	12.31	9.56	16.620

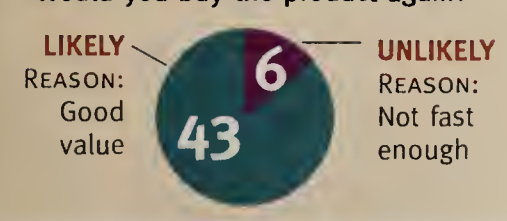
The Khornerstone rating represents an overall computer performance. OLTP ratings are transaction processing benchmarks; Rating 2 uses larger files then Rating 1. The multitasking benchmark measures the total time to execute 10 simulated tasks using large data files. Ratings not present means that benchmark was not performed on that system.
Servers listed are the latest tested by ARS/Workstation Labs.

Source: ARS/Workstation Labs

Sun's SPARCserver 10

RESPONSE BASE: 49 USERS

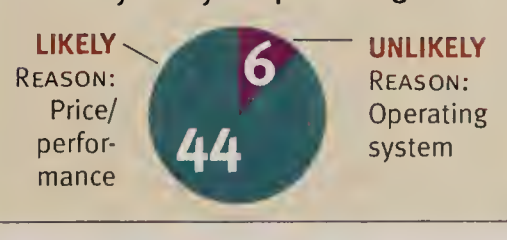
Would you buy the product again?



IBM's RS/6000 Powerserver

RESPONSE BASE: 50 USERS

Would you buy the product again?



METHODOLOGY

User names were obtained from a combination of vendor and non-vendor sources. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey and tabulated the results. The response base was 50 users for IBM, 49 for Sun, 39 for DEC, 27 for HP and 20 for DG.

Users rated their satisfaction with their installed products and were not asked to compare or rate one product directly against another in the Scorecard. To compute the overall score for each product, perform the following steps: 1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score. 2) Repeat the process for all remaining categories. 3) Average the resulting figures for the average weighted score. 4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10.

ACKNOWLEDGMENTS

Computerworld thanks the following firms for their assistance in preparing this Buyers' Scorecard: *Computerworld* Database Division; Computer Intelligence/Infocorp; and The Anderson Report.

Servers

Scalability and multiple processors

Everyone needs room to grow

By Alan Radding

The hottest thing in the reduced instruction set computing (RISC) world is now infiltrating all servers: symmetrical multiprocessing (SMP).

The reason multiprocessing is so hot is that it plays a direct role in scalability. Managers are hard-pressed to predict what the load will be a few years or even a few months after the system is installed. Instead, they look for scalability — the ability to support lots of disk and memory, add multiple processors and upgrade processors — to expand within the box or move up in a product family without disturbing applications or databases.

The rule of thumb is to pick a vendor where you can start at the beginning or middle of the product line from a capacity standpoint. That leaves you ample room to grow. The big RISC vendors — Hewlett-Packard Co., Sun Microsystems, Inc., Digital Equipment Corp. and IBM — generally offer the greatest scalability. For example, DEC reports 1,000-to-1 scalability for the new Alpha-AXP server line using multiple processors.

Super difference

The superservers have jumped on the scalability bandwagon, but there's a difference: Not all multiple processing schemes are created equal. For example, asymmetrical multiprocessing (AMP) — which is what superservers such as NetFrame Systems, Inc., Tricord Systems, Inc. and IBM offer — dedicates particular processors to specific functions. This boosts I/O performance (good for file serving), but it doesn't do anything for application serving.

On the other hand, SMP divides work evenly between the processors, which share memory. All processors are fully involved in the processing, so processing power scales almost 100% as new processors are added. For this reason, SMP is very valuable for application serving, but it doesn't do much for file serving.

Part of the problem for the superservers is that Novell, Inc. NetWare doesn't support SMP, although many Unix offerings do.

Expansion alternatives

The superserver vendors are working on advancing their multiprocessing capabilities. For instance, NetFrame recently announced a new family of AMP servers that sport both multiple application processors and multiple I/O processors. A different application running under a different operating system can run concurrently on each application processor. This design will allow an organization to combine file serving and application serving in one box in a balanced way.

In the RISC world, IBM also does not offer SMP. Instead, it provides clustering, which is the ability to couple RISC System/6000s together to boost performance while increasing the high-availability options. This solution has a drawback: It requires more overhead than SMP.

For organizations that expect to grow, scalability is a key consideration. "We looked at Data General's Aviion, but they only offered four processors at the time and were promising eight in a year," explains David Barrett, vice president/information technology at Investco Funds Group in Denver.

With NCR, Barrett gets eight processors with 512M bytes of memory and a 20G-byte disk farm. And, he can scale higher from there. •

Multiprocessing menu

The maximum number of processors available is a major criterion in the purchase of RISC servers. With NCR, Wyse, Sequent and Pyramid, you can go higher still, with Pyramid the highest at 32 processors.

IBM forgoes multiprocessing and instead clusters its machines.

DEC will introduce Alpha with four processors and says it will go to six within a reasonable period.

HP is going from two processors to four with its 9000 line.

Sun already has four processors with its SPARCserver line.

DG Aviion scales to eight processors.

Commentary

Neal Nelson

The reality of RISC

My benchmarking tools have shown for years that for business users, RISC offers little or no advantage over CISC-based machines.

In fact, CISC- and RISC-based network servers are quite similar in areas that are important to business such as network and disk I/O. For many business applications, CISC may be both faster and cheaper, while RISC may be better for engineering and scientific work.

To understand why CISC and RISC deliver similar performance on business applications, let's look at their architectures.

All told, I've found five major differences between CISC and RISC:

• **Chip technology:** RISC machines are supposed to have much faster CPUs than CISC machines. To a certain extent, this speed advantage is an illusion because each RISC instruction is simpler and may perform less "work" than a CISC instruction.

A CISC machine, for example, might require three CPU clock "ticks" to perform one instruction of adding two binary values in memory and leaving the result in memory. At 33 MHz, this would represent 11 MIPS for this machine (33 million cycles per second divided by 3 cycles per instruction equals 11 MIPS).

I know of a RISC machine that had to perform four "instructions" — two loads, one add, one store — totaling 11 clock ticks to do this same task. If this machine were running at 80 MHz (29 MIPS), it would actually perform user tasks more slowly than the 33 MHz (11 MIPS) CISC machine.

As in the children's game, it is the difference between baby steps and giant steps. Two giant steps per second might cover a lot more ground than 10 baby steps per second.

Ultimately, a RISC machine may not offer any benefit to business users by executing less powerful instructions at a faster rate.

• **Floating-point math capability:** RISC evolved from the engineering workstation, where floating-point math is highly valued for scientific calculations such as square root, sine and cosine. CISC evolved from the business market, where floating-point math is less in demand.

Businesspeople want to know the answer to retrieval questions such as "What is the current balance?" and they usually don't ask questions that require floating-point math capability.

• **System bus technology:** At one time, the relationship was very clear: CISC machines (represented primarily by PCs) offered a very low-cost, low-performance standard bus. RISC machines (represented primarily by workstations) offered expensive, proprietary, incompatible high-performance buses.

By and large, RISC machines are still offering the same high-cost, proprietary, high-performance buses. On the other hand, CISC now has medium-performance buses, thanks to EISA and Micro Channel Architecture.

When high-performance buses are high-cost and proprietary as well, the benefits are not as significant for business users. Users can find good buses in both CISC- and RISC-based machines.

• **Multiprocessing capability:** For several years, the state of the art in multiprocessing has been driven by the CISC segment. Sequent at the high end and Corollary, Inc. at the low end have both been using Intel chip technology to push the limits in multiprocessing.

For a while, RISC machines didn't offer multiprocessing at all. This was partly because their chips had trouble supporting it and partly because their primary customers (engineers at workstations) didn't want it.

Some RISC vendors are currently offering multiprocessing but in most cases on a much smaller scale than the CISC vendors. A typical RISC multiprocessor will have a maximum of four CPUs.

Multiprocessing is economically sensible because a business user can purchase a machine with a few CPUs installed and add more as processing needs increase.

• **Operating system version or port:** Right now, CISC has performance advantages for NetWare and similiar operating systems and RISC has the advantage for Unix. Both of these differences should blur into nothingness during the next few months.

Traditionally, RISC servers have run Unix, while CISC servers ran Novell's NetWare. This is changing. Microport, Inc., Dell, Everex Systems, Novell and Sun now offer Unix Version 4 for CISC machines, and native ports of NetWare are showing up for RISC machines. •

Similarities between CISC and RISC machines

➤**Disk drives:** BOTH USE THE SAME DISK DRIVE TECHNOLOGY AT THE SAME BUS SPEEDS SPINNING AT THE SAME SPEEDS AND ACCESS TIMES.

➤**Support chips:** BOTH USE THE SAME SUPPORT CHIPS SUCH AS SMALL COMPUTER SYSTEMS INTERFACE CONTROLLER AND ETHERNET LAN CHIPS.

➤**Main memory chips:** VIRTUALLY ALL MIDRANGE AND SMALLER SYSTEMS ARE USING THE SAME MEMORY CHIP TECHNOLOGY SUPPLIED BY SIX OR SO MAJOR RANDOM-ACCESS MEMORY CHIP MANUFACTURERS.

➤**Static RAM cache chips:** VIRTUALLY ALL SYSTEMS ARE USING SECONDARY CPU CACHES WITH 15- TO 20-NSEC STATIC RAM CACHE CHIPS.

➤**Communications:** ALL THE SYSTEMS CONNECT TO THE SAME ETHERNET WITH THE SAME PROTOCOLS.

Nelson is owner of Neal Nelson & Associates, a benchmarking firm based in Chicago.

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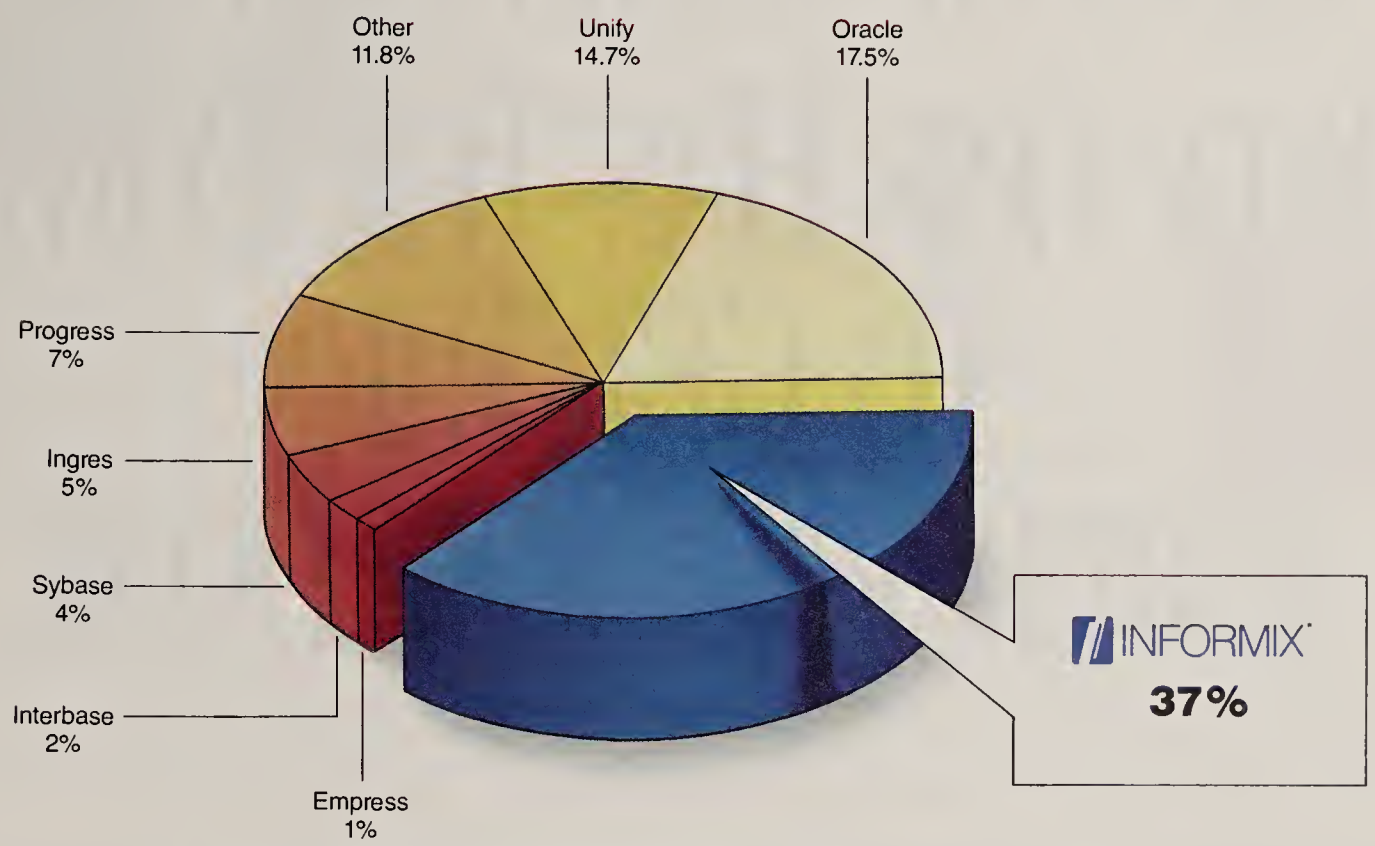

Worldwide UNIX Relational Database Software License Shipments, 1991
Source: International Data Corporation, 1992

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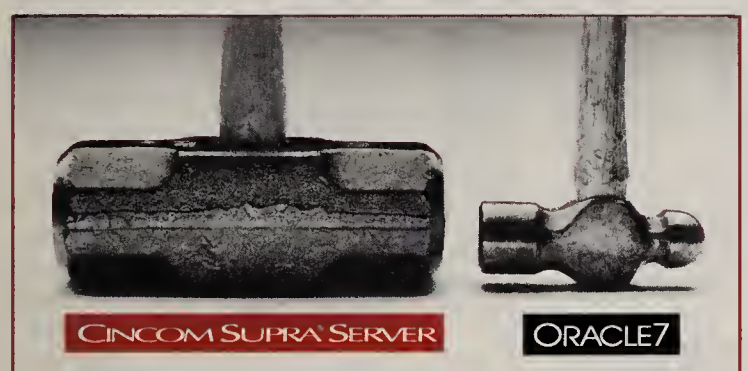

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Production Quality Distributed Transaction Management *(Transaction Partners versus Two-Phase Commit)*	Yes	No
Distributed Updatable Join Views	Yes	No
Three Schema Architecture	Yes	No
Cursor Management *(Auto Cursor, Cursor Stability, Fully Scrollable Cursor)*	Yes	No
Support of Multimedia Object Types	Yes	No
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System reliability

What, me worry?

By Alan Radding

When it comes to reliability, it's not so much *whether* the system will fail; that's bound to happen sometimes. What users are more concerned with — and what vendors work to build into their machines — is how fast you can diagnose and fix the problem.

The fix usually comes in the form of high-availability capabilities such as disk mirroring, disk duplexing, redundant arrays of inexpensive disks support and error-correcting memory (see box).

There was a time when you had to go to Sequent Computer Systems, Inc., Digital Equipment Corp., Hewlett-Packard Co. or Sun Microsystems, Inc. for these features. Now, reduced instruction set computing servers and superservers offer these features.

It was the reliability features that persuaded Robert Curry, associate executive director of information resource management at the Federal Energy Regulatory Commission in Washington, D.C., to use a Tricord Systems, Inc. superserver for a key document-access application.

Tricord, actually, has gone beyond high availability with a new server that uses Novell, Inc.'s NetWare System Fault Tolerance Level III software, which allows one server to mirror another. This level of reliability does not come cheap: It requires two superservers.

High availability sufficient

For most users, however, the basic high-availability features are sufficient. "The vendors know the servers have to be reliable. They engineer them to be extremely reliable," says Lynn Berg, program director of midrange computing strategies at Gartner Group, Inc.

Jerry Whetnall, assistant vice president of corporate systems at Midland Mutual Life Insurance Co. in Columbus, Ohio, reports losing a total of one CPU, about six disk drives and an occasional memory chip among 22 Compaq Computer Corp. SystemPros during three years. "Our downtime over the last year for all our servers came to three to four hours."

There are some reports that superservers require a higher level of maintenance and are not something that the everyday PC guru can handle.

"We needed [a NetFrame engineer] just to install a tape drive, and even then it wasn't easy," reports John Weeden, management information program manager at The Washington State Division of Alcohol and Substance Abuse in Olympia. Rather than rely on a NetFrame Systems, Inc. engineer, the group switched temporarily to a 486-based PC for its Sybase, Inc. SQL Server database, while relegating the NetFrame machine to less critical wide-area network file sharing. •

High-availability features

➤**Mirroring:** One controller mirrors data on two sets of disks. This has been standard for years in Unix and is new to superservers.

➤**Duplexing:** Multiple controllers mirror data on multiple disks. This is more flexible and faster than mirroring because it can do two reads/writes at the same time.

➤**Error-correcting memory:** Memory that automatically looks for parity checking; when it doesn't find it, it notifies the CPU and puts it into memory the right way. This has almost become a given in most systems.

➤**Hot disk swapping:** The management system tells you there's a bad disk and allows you to plug in a new disk without turning the server off. This is new to superservers and has been offered on RISC machines longer.

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Out to get you

Computer security and law enforcement aces give you the lowdown on the biggest threats to corporate security — and what you can do about them

By James Daly

It's a disturbing paradox. The one-in-a-million chance that a flood will soak their data center prompts conscientious information systems managers to build vaults capable of surviving a nuclear blast.

Yet every day they allow users to insert unscanned floppy disks into their PCs. Or let employees tote around an unencrypted copy of next year's business plan in an easily stolen laptop computer. Or toss old memos filled with passwords and internal information into the dumpster at night.

All over the U.S., security experts claim that corporate America is still largely unprepared for the security challenges of the information age. While most organizations have sunk massive sums of money and time into their computer systems, they don't do as much as they should to protect their investment.

"There's a lot of room for proactive efforts in computer security; I just wish more of it was being done," says Scott Charney, chief of the computer crime unit at the Federal Bureau of Investigation in Washington, D.C.

Computers and communications systems are prime targets for attack by competitors, foreign interests or even disgruntled employees. The goal of complete data security is probably unattainable, but there are still plenty of weak points the average IS manager *can* shore up but hasn't. What are the biggest security risks for corporations these days? Where are the weak points? What should be done to protect critical information? We asked some top security experts:

PBX toll fraud

Security experts agree that the theft of telephone services is the security-related Achilles' heel of corporate America. In the past several years, toll fraud has grown so fast that U.S. businesses are expected to shell out more than $4 billion for unauthorized, free long-distance calls this year, according to Telecommunications Advisors, Inc., a Portland, Ore., consultancy.

Here's a harsh twist: Because many companies own the equipment the thieves penetrate, long-distance carriers say the companies are liable for the added charges. In other words, if unauthorized calls are discovered on your phone bill — be they for $100 or $100,000 — you are the one who ultimately pays. Not AT&T. Not Sprint. Not MCI.

Don Delaney, a New York State Police senior investigator, says the illegal access and sale of phone service has turned into a thriving underground business. Once in, system crackers resell their means of entry to others, who in turn fill the phone lines with more illicit traffic.

A thriving call/sell operation attracts drug dealers, illegal aliens and organized crime fig-

Security threats, *page 78*

Daly is a *Computerworld* West Coast correspondent.

Security threats

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ures, Delaney says, all of whom line up for free calls that are difficult to trace.

Such hackers loop in and out of a firm's private branch exchange (PBX) to reoriginate the calls and prevent line tracing. Crimes are often committed over 800 service lines, so the companies also pay for the criminal's operating expenses.

As a result, law enforcement officials say, toll fraud is a problem that is going to worsen. "It's not a matter of *whether* people will be hit but *when*," Delaney says. Last year, he received 150 complaints of toll fraud.

Toll fraud has become so prevalent that firms can buy toll fraud insurance from companies such as The Travelers Corp. in Hartford, Conn.; Warren, N.J.-based Chubb Corp.; National Union Fire Insurance Co. in Pittsburgh; and Aetna Life and Casualty Co. in Hartford, which limits its policy writing to financial institutions. Coverage can be expensive — up to $50,000 for million-dollar policies.

Users say the key to fighting phone fraud is quickly spotting abnormal calling patterns. Last year, Sherry Roggeman, communications coordinator at Empire Southwest Co., a heavy equipment dealership in Phoenix, noticed an unusual amount of telecom activity with Puerto Rico, a place where Empire Southwest does little business.

To Roggeman's dismay, she discovered that someone had gained unauthorized access to the company's PBX through its 800 number and had placed $15,000 worth of long-distance calls. "This is very frightening," says a shocked Roggeman, who has since added a fraud-detection system. "It's scary to think that someone is spending all this time trying to crack my systems."

Many products are already on the market to ease some of this hacker-generated anxiety. Atlanta-based Complementary Solutions, Inc., for instance, makes Telemate FraudFighter, which learns normal telecommunications activity levels and then looks for deviant patterns. Similarly, Xiox Corp. in Burlingame, Calif., offers fraud prevention products that use artificial intelligence features.

Public carriers also sell toll fraud support services. Sprint Corp. now offers Sprintguard, which provides notification of abnormal calling patterns and an insurance plan that limits customer losses. AT&T offers a similar program called Netprotect to relieve customers of liability for international long-distance fraud. On Feb. 2, MCI Communications Corp. joined with a multipronged monitoring and protection initiative called Detect.

Costs for services vary, depending on what you need, how much coverage you want and how many people are covered.

Attorneys are getting in on the PBX toll fraud act, calling for tougher laws. In New York, toll fraud crimes are still handled as misdemeanors. AT&T, in conjunction with others, is working on a proposed bill to make toll fraud a felony.

Experts advise, however, that users not rely on others to prevent toll fraud. "Right now, users are doing very little to protect themselves," says John Haugh, chairman of Telecommunications Advisors. "AT&T handles about 115 million calls a day. AT&T can't look out for you."

Theft of portables

As purchases of easily transportable laptop and notebook computers have soared in the past 18 months, so has their theft. A typical 5-pound laptop can carry a hard disk loaded with sensitive strategic and financial data, as well as long-term marketing and business plans. Laptops also provide a perfect way to steal information from a corporate database by providing all the software needed to dial into the company mainframes.

"In other words, they're a perfect target for thieves," says Steve Purdy, senior associate at New York security services firm Kroll Associates, former Secret Service agent and chairman of the Federal Computer Investigators Committee. "The loss of the hardware is the least of your worries. Think of how much it would be worth to your competitor to have a list of your business contacts or your business plan for next year."

Yet many executives treat these treasure troves of corporate data sloppily. In a recent survey of users of portable computers by International Data Corp. in Framingham, Mass., only 1% of the respondents said they perceive security as a problem of portables, despite numerous high-profile thefts.

Firms are starting to come to grips with the problem, but only after getting burned. According to the IS director at one large chemicals plant: "We finally became aware of just how vulnerable we were when the laptops started disappearing. There's a lot of competitive data on these things, so it's like stealing files out of a filing cabinet."

Some firms have come up with ingenious ways of denying access to information even when a laptop is stolen. At Conde Nast Publications, Inc., an identification chip has been placed in some laptops to verify the user's right to access the company's mainframe. If a laptop is stolen, access to the machine is turned off, and when someone tries to dial up on the stolen laptop, the mainframe sends out a program that erases his hard disk.

Companies such as Shearson Lehman Brothers, Inc., PaineWebber, Inc., Martin Marietta Corp., Grumman Corp. and The Boeing Co. have already instituted stringent portable computer protection policies that include increased awareness programs and rigorous laptop checkout policies.

A good first step to take in portable computer security is to secure the computer physically. Companies such as San Rafael, Calif.-based PC Guardian and Z-Lock Mfg. Co. in Redondo Beach, Calif., sell lightweight steel security cables to tightly attach a laptop or notebook to a desk or table.

Step two involves encrypting the data on the portable. "That way, if someone gets hold of the data, they can't do anything with it," Purdy says.

Better yet, "allow people on the road to store information only to their floppy," says Paul Joyal, former director of security at the Senate Intelligence Committee and president of Silver Spring, Md., security firm Integer, Inc. "Then when they're done working, they can just carry the floppy around with them."

Viruses

When last year's Michelangelo virus scare turned out to be a techno-dud, some security managers feared that future warnings about viruses would fall on deaf ears. Like rattlesnakes, computer viruses exist and should be avoided. But they're not lurking behind every rock.

"The [Michelangelo] hype was very exaggerated, but computer viruses are still a very genuine threat," says Sergeant Bob Brown, who works at the Los Angeles County sheriff's office and is a cofounder of the High-Technology Crime Investigation Association, a 400-member organization of law enforcement and security personnel.

Virus concerns should grow as the move toward client/server architectures continues and information becomes more distributed throughout the organization — and hence harder to secure.

The best way to defend against a virus intrusion is to always be aware and recognize any attempt at infection. Experts suggest the following tips to decrease the risk of infection:

- Install a reliable antivirus protection package on your machine, and scan all disks before use. There are many public domain virus detection/prevention packages available on the market.
- Back up all critical data and programs, and periodically inspect backups for data integrity. Great care should be taken to ensure that backups are not infected. The last thing you want to do is reintroduce a virus when disinfecting your system.
- Do not execute programs that are unfamiliar or free applications that sound too good to be true.
- Write-protect original distribution

Nip hackers in the bud

One of the most frustrating aspects of computer crime is that many of the lawbreakers are very young — often high-school age. Sergeant Bob Brown, co-founder of the High-Technology Crime Investigation Association, suggests that if IS managers have the time, they may want to distribute computer ethics rules to local high schools or even volunteer to teach a class on the subject. "Computer security people can get involved at the local level and head off some of the crime before it occurs," Brown says.

Some high schools in the San Francisco Bay area have gotten the word and are beginning to integrate security topics into their computer classes, in much the same way as the Software Publisher's Association conducts its anti-piracy campaign. "If we can nip hackers in the bud — when they're just starting out — half of our problems would already be solved."

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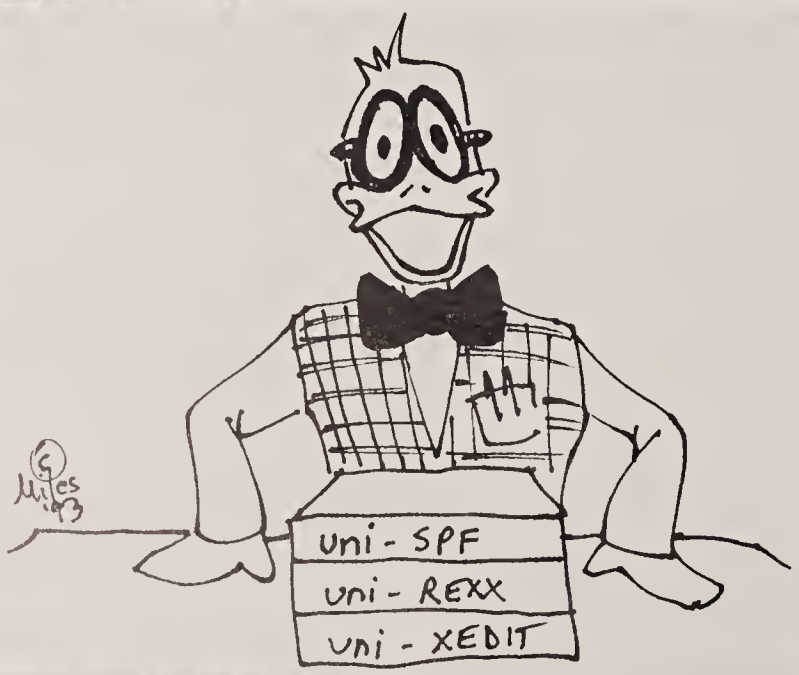

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disks before using them.

• Be on the lookout for symptoms of a virus infeetion, whieh inelude unexpeeted ehanges in the time stamps and/or length of files, particularly exeeutable files; programs that take longer than usual to start or perform; programs that attempt to write to write-proteeted media for no apparent reason; exeeutable files that suddenly vanish or are modified; unexplained deereases in computer memory; or increases in areas marked as "bad seetor/clusters" on either hard or floppy disks.

Disgruntled workers

One of the darker sides of the outsoureing and downsizing movement in eorporate Ameriea is staff eutbacks — often severe ones. Disgruntled workers eould represent a serious seeurity threat.

Charles Cresson Wood, a seeurity consultant in Sausalito, Calif., recounts the story of a eomputer systems manager at a Florida newspaper who was fired and took a position at a competing publieation. His original employer soon diseovered that its reporters were eonstantly being seooped on stories for whieh they thought they had an exelusive. The paper later diseovered that the aeeount for the terminated computer systems manager had never been turned off and that he had repeatedly been accessing the old employer's computer to get information about stories in progress.

Wood says that at the time of an employee termination, user IDs and passwords for both computers and networks should be immediately revoked. Companies should remind a departing employee of any signed eonfidentiality agreements and eolleet eonfidential or proprietary information in his possession, Wood says.

"It may sound elementary, but it's surprising how many organizations do a poor job of this, if they do it at all," Wood says. Part of the problem is that in downsized organizations, IS people are shouldering the duties of departed staff members. Oftentimes, security matters take a baekseat beeause harried workers need to deal with day-to-day aetivities.

Aeeording to Wood, one savvy company has written an applieation that automatically transfers personnel change-of-status information in a DB2 database running on a mainframe into a security-related eomputer privilege database. The program automatieally revokes the privileges of any users who leave the company. Currently, these interconnected systems are rare.

Security managers also need to consider site access control when dealing with angry former workers, hackers or even unsympathetic managers. "Anyone ean pop a smoke bomb into a company's air intake; the sensors would read it as a fire, and the sprinklers would go off," says Ian Murphy, a seeurity consultant who serves as president of IAM/Seeure Data Systems, Ine. in Gladwyne, Pa. "For 50 cents, anyone can shut a computer system down."

Murphy notes that dumpster diving, in which haekers go through a eompany's garbage looking for disearded manuals or internal memos that would tell them more about the telephone or computer system, remains an easy way to steal company jewels. "You'd be amazed what you can find in the trash: aeeess codes, passwords, everything," he says. Murphy would know: As a young man, he haeked his way into a phone eompany computer using data gleaned from several dumpster diving episodes. •

Ignorance isn't bliss

Without a doubt, the single most effeetive computer security measure an organization can take is to ereate a well-informed and competent work force. Employees should be made aware of the ways in whieh they can be tricked into giving away their passwords or aeeess eodes by hackers posing as upper management or telephone eompany personnel.

According to industry watchers, eompanies must teaeh employees to be skeptical and to refuse to give out sueh information until they can double-check the source.

"Before we let a person drive a car, we give them driving lessons. Why shouldn't we tell employees the rules of the road before letting them eruise on the data highways?" says Scott Charney, ehief of the eomputer crime unit at the FBI in Washington, D.C.

He suggests starting with a seeurity awareness week, complete with seminars, slogans and surveys. Follow that up with posters, newsletters and refresher eourses.

Great Moments in Hacker History

SEPTEMBER 1970 John Draper, a.k.a. Captain Cruneh, diseovers that the prize whistle offered in boxes of Cap'n Cruneh eereal perfectly duplieates the 2600 frequeney of a WATS line, allowing him to make free telephone calls.

1971 Underground activist Abbie Hoffman forms the Youth International Party Line, whieh ineludes tips on getting free eable television and phone service.

MID-1970s/EARLY 1980s Teen eomputer whiz Kevin Mitnik begins making a habit of tapping into data banks and destroying information, altering credit reports of perceived enemies and disconnecting the phones of celebrities. His most famous exploit — eleetronically breaking into the North American Defense Command in Colorado Springs — helped inspire the 1983 movie *War Games*.

1976 Two self-described hackers, Steve Jobs and Steve Wozniak, form Apple Computer, Inc., ereating a multimillion-dollar industry and giving birth to a new generation of hackers.

JULY 1981 Ian Murphy, a 23-year-old who calls himself Captain Zap, gains notoriety when he breaks into systems at the White House, the Pentagon, BellSouth Corp. and TRW and deliberately leaves his resume.

NOVEMBER 1988 Robert Morris Jr., son of the National Seeurity Ageney's chief computer seientist, creates the Internet Worm. The program goes haywire and creates an estimated $40 million to $90 million worth of damage before it is stopped.

LATE 1988 A gang of haekers ealling itself the Legion of Doom begins to eruise eleetronie bulletin boards. Gang members reportedly "borrow" phone company technical doeuments and distribute them on bulletin boards.

1989 Publication of Cliff Stoll's "The Cuekoo's Egg," a best-selling tale of international computer espionage. Stoll, an astronomer at an Internet lab in Berkeley, Calif., reeounts how he electronieally traeked down German haekers who were breaking into eomputers at American and European military and defense industry-related sites to steal information for the KGB.

JANUARY 1990 AT&T has a neareatastrophic expeerienee in the form of a nationwide computer systems erash. The Seeret Service spearheads Operation Sundevil, which was designed to traek down the authors of the AT&T ineident. The erash is attributed to information eontained in a text file for the BellSouth 911 emergeney number, believed to have been stolen by Legion of Doom members.

JANUARY 1990 Craig Neidorff, 19-year-old editor of the eleetronie magazine *Phraek*, is eharged with illegally publishing BellSouth 911 documents, and his eomputers are confiseated. Charges are later dismissed when it is diseovered the documents are publiely available for less than $30.

MARCH 1990 The Secret Service raids the home of Steve Jackson, who published role-playing computer games in Austin, Texas. Agents seize computers they say contain a "handbook of computer crime," whieh is later discovered to be a role-playing book under development. Jaekson is not eharged with any crime, but the prolonged disruption and seizure of equipment brought his business close to bankruptey.

JULY 1990 Several pioneers of the PC industry, ineluding Steve Wozniak, Lotus Development Corp. founder Miteh Kapor and Sun Microsystems, Inc. eo-founder John Gilmore, form the Electronie Frontier Foundation (EFF) to proteet the First and Fourth Amendment rights in computer teehnology. The EFF claims Operation Sundevil violates Fourth Amendment proteetion against illegal search and seizure.

AUGUST 1990 Computer Professionals for Social Responsibility file a Freedom of Information Aet request for FBI reeords on secret monitoring of bulletin boards aeross the country.

JULY 1992 In New York, five young men are eharged with breaking into computer systems at several regional phone companies, large firms such as Martin Marietta, universities and eredit-reporting eoncerns sueh as TRW, which reportedly had 176 consumer credit reports stolen. The ease marks the government's first investigative use of court-authorized wiretaps to obtain eonversation and data transmission of haekers.

DECEMBER 1992 Kevin Poulsen, an infamous hacker who once used the computer network alias "Dark Dante," is eharged with stealing tasking orders relating to an Air Force military exereise. Poulsen is aeeused of theft of national information under a seetion of the federal espionage statute and faees up to 10 years in jail.

— James Daly

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Evolution of IS

Surviving the coming jolts

By Leslie Goff

WILL YOU BE OBSOLETE in the information systems organization of the year 2000? If you're not sure, try asking yourself a few questions: Are you ready to slug the next person who says Cobol programming is dead? Do you still think of networks as "the big three — ABC, NBC and CBS"? Is "the business" a place you keep meaning to visit, like Tahiti?

PREPARING FOR 2000

"It's essential that you get out of your local environment - look around. Look at the companies that are eight years ahead of yours, and you're looking at the year 2000 for your company."

RICHARD KOELLER, WHIRLPOOL CORP.

If you answered "yes" to any of these questions, you might as well answer yes to the first.

Technology may not look radically different in the year 2000 than it does now, but the IS organization will. Those who change with the times will be the best-positioned for the jobs to come, according to IS managers and futurists.

"The new IS professional will be a hybrid, born and raised in the business world but working from a strong base of management and computer skills," says Peter de Jager, an IS consultant and speaker in Brampton, Ontario.

The march out of IS and into the business units will continue, and IS professionals will face job competition from end users who acquire technical skills. The IS organization will be flatter, with less room to move up.

Depending on how aggressively IS reacts to the change, the IS professional "could be displaced to the level of a mere technician," says Joseph Coates, president of Coates and Karret, a futures research firm in Washington, D.C.

Robert Zawacki, a professor of management and international business at the University of Colorado in Colorado Springs, describes the future systems department as "nothing more than a network organization" with responsibility for strategy, standardization and infrastructure issues. Other views differ.

Richard Koeller, vice president of information technology at Whirlpool Corp. in Benton Harbor, Mich., says firms will increasingly value information over technology. "The importance of technology will remain the same, but the importance of information will double," he says.

There is good news for the IS professional who takes on distributed technologies — local- and wide-area networks, telecommunications, PCs, Unix, C++ — and improves "soft" skills. The rising tide of end-user computing and the increased emphasis on information access will create IS jobs dispersed throughout business.

PREPARING FOR 2000

"Read trade books, take night courses, go to trade shows to see new developments. Stay ahead. If you think you're through with your education, you'll be passed by."

Robert Zawacki, University of Colorado

Help desks and customer support organizations will rise in importance. Voice and data networks will continue to merge, opening telecommunications and networking positions. Decision-support systems will proliferate.

"There will be a lot of IS jobs that don't exist today," Koeller says. "There will be changes in how we do the work and what the work is."

"All of our jobs will change," says Wayne Pattison, director of data center operations at Kansas City Southern Railway Co. in Kansas City, Mo. "Things will evolve from mainframes being the focus to servers being the focus."

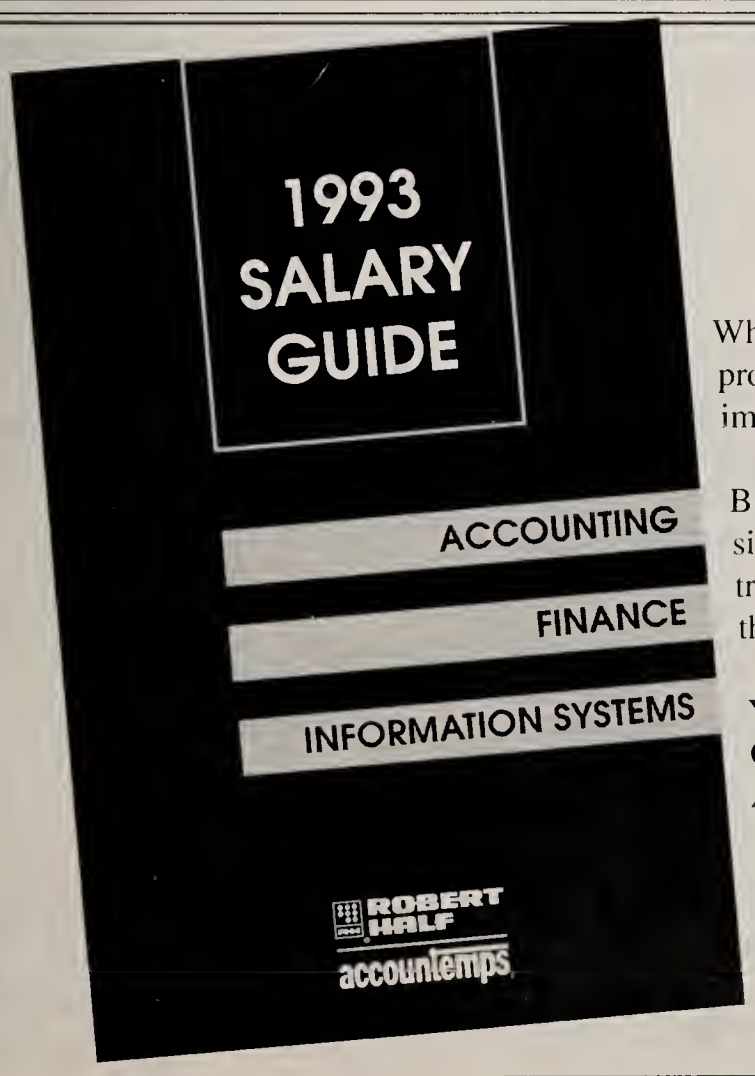
Instead, "business analysts" or "business systems consultants" will be as universal as mainframe programmers were in the 1970s. These IS professionals will be interdisciplinary, with myriad strong technical skills and business sense.

PREPARING FOR 2000

"We'll know a lot more [about the shape of things to come] in the next three years, so now is the critical time to tune in to trade information and the media for information on trends."

Gerald Celente,
The Trends Research Institute

Goff is a New York-based freelance writer.



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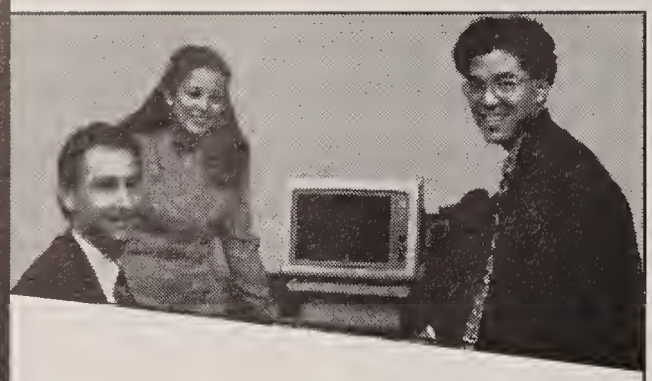

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Designation change

Cast your vote on certification

By Mary Jo Haught

CDP. CCP. CSP. If you don't know what these aeronyms mean, it's OK, beeause soon you won't have to.

They're part of the eonfusing alphabet soup used in the eertifieation of eomputer professionals. The acronyms stand for Certified Data Proeessor, Certified Computer Programmer and Certified Systems Professional.

Now, the nation's largest eertifier of information systems professionals and managers is preparing to simplify the process by standardizing titles.

The Institute for the Certifieation of Computer Professionals (ICCP), a eonsortium based in Des Plaines, Ill., plans to combine the titles in the hopes of making certification morc widespread.

Title wave

An estimated 47,000 IS profcssionals are eertified. Many IS professionals, however, are confused about titles or feel they don't fit into existing title eategories.

Starting next January, all IS professionals will be broadly grouped under a single title, whieh has yet to be ehosen. The new title will be representative of those eurrently certified, as well as those who wish to be in the future.

Onee eertified, eomputer professionals may ehoose from among several speeialties ineluding business information systems, eommunieations, offiee information systems, software engineering, systems programming and systems sceurity. They ean be eertified for two specialties per test session, along with as many speeialty areas as they're willing to prepare for. They can also petition the ICCP to add other specialties to the certification program.

Robert S. Tipton, chairman of the Single Designator Transition Committee, says the organization hopes the new, simplified proeess will benefit the entire IS profession and help to set new directions. Besides increasing visibility, a single common title raises professional standards by helping members upgrade skills, he says.

In addition, in surveys eonduet-ed by the ICCP, 92% of ehief information offieers indieated that the presence of an ICCP eertifieate on a candidate's resume influenees their hiring deeision. Between 57% and 82% of supervisors and CIOs said certification would have some bearing on promotions, salary inereases, performance appraisals and eonsideration for supervisory responsibilities.

In hopes of attraeting new interest, the ICCP will also begin offering terminal-based examinations at several sites by ycar's end.

The 21 member soeieties of the ICCP — including the Association for Computing Machinery, Assoeiation for Information Management, Association for Systems Management, Assoeiation for Women in Computing, Black Data Proeessing Associates and Data Proeessing Management Assoeiation, to name a few — are now trying to determine what the new title designation should be.

If you're interested in suggesting title names, call Tipton at (303) 730-1118, or fax/mail your suggestions using the form at the right.

Haught, a CDP, is a software engineer at MJ Systems in Charlottesville, Va. She is a member of the Data Processing Management Association board of directors.

ICCP INSTITUTE FOR THE CERTIFICATION OF COMPUTER PROFESSIONALS

Single Designator Survey

1. MY CHOICE FOR THE NEW CERTIFICATION TITLE (FULL WORDS):

2. REASON I SUPPORT THIS CHOICE:

3. I CURRENTLY HOLD THIS/THESE CERTIFICATIONS (CHECK ALL THAT APPLY):
☐ CCP ☐ CDP ☐ CSP

4. MY TOTAL PROFESSIONAL COMPUTING EXPERIENCE (IN YEARS):
☐ Less than 10 ☐ 10-20 ☐ More than 20

5. I AM ACTIVE IN THE FOLLOWING ICCP SOCIETIES:

6. ADDITIONAL COMMENTS:

Please fax completed form by April 1, 1993 to Robert S. Tipton, Chairman, ICCP/Single Designator Transition Commitee, at (708) 299-4280 or send c/o ICCP, 2200 E. Devon Ave., Suite 268, Des Plaines, Ill. 60018-4503.

FAST TRACK

VOICE OF EXPERIENCE

If you have a career question you've always wanted to ask your boss but didn't have the courage, Tom Loane has your answer. The vice president of IS at Alamo Rent-A-Car, Inc. will be our Fast Track guest adviser in the April 12 issue. If you'd like him to answer your career question, fax it to Kelly Sewell by March 26 at (508) 875-8931.

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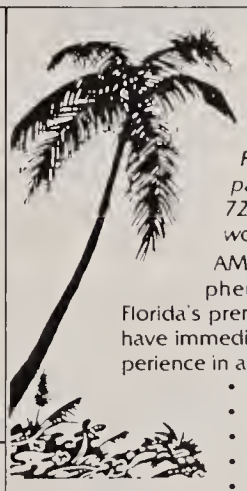

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SOFTWARE ENGINEERING MANAGER; BY APRIL 21, 1993; PLEASE SEND RESUME TO: EMPLOYMENT SECURITY DEPARTMENT, E&T DIVISION, JOB # 355990-M, P.O. BOX 9046, OLYMPIA, WA 98507-9046. JOB DESCRIPTION: Plans, designs, and develops complex software for micro computers. Designs specifications for personal computer systems and full featured applications products for Arabic and Hebrew markets with bi-directional enabling, fonts and printer and screen drivers for Arabic and Hebrew characters. Utilizes Windows and MS-DOS operating systems and "C" and 80x86 assembly programming languages. Supervises and provides technical direction to 2-4 software design engineers. REQUIREMENTS: Bachelor's degree in Electrical Engineering, Computer Science, Mathematics or Physics; 4 years of software design development project management and development experience of Arabic operating systems and word processing applications software for personal computers from conception to commercial release of products. Must include 2 years work experience in programming or computer software design utilizing "C" and 80x86 Assembler Series languages, design and implementation of graphical user interface software, and software to display Arabic characters following rules of contextual analysis, including diacritics and ligatures, and 6 months work experience in programming or computer software design utilizing MS-DOS and Windows operating system. Must be able to read and write Arabic. Experience may be gained concurrently. MUST HAVE LEGAL AUTHORITY TO WORK IN THE UNITED STATES. JOB LOCATION: Seattle Area Employer. SALARY: $52,500 - $68,500 per annum, depending on experience. Compensation package includes bonuses and stock options. 40 hours per week, flex time. EOE.

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Review of applications will begin immediately and will continue until suitable applicants are identified. Preference will be given to applications received before April 30, 1993.

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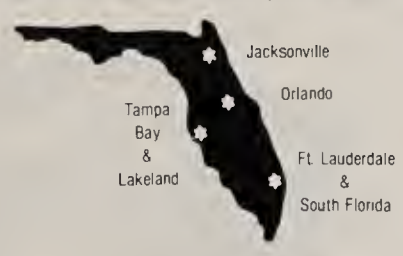

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Computerworld/CorpTech Career Index

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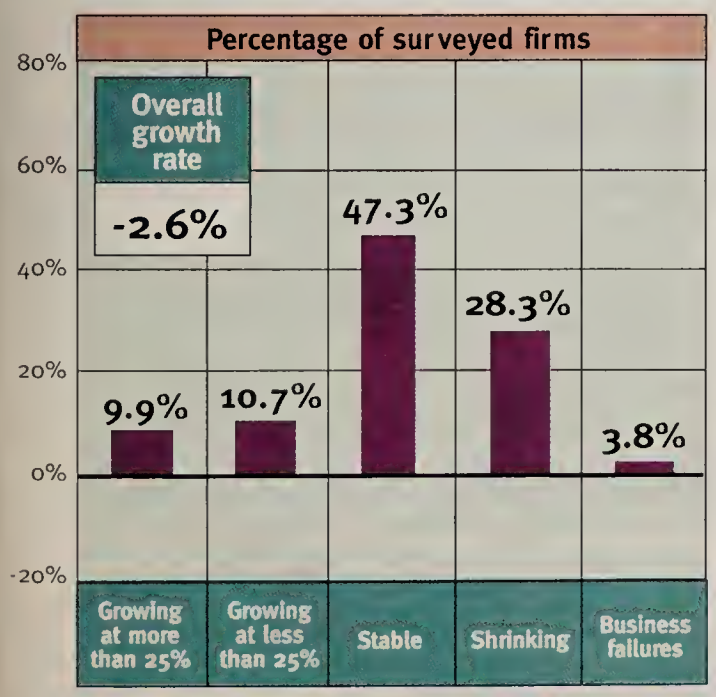

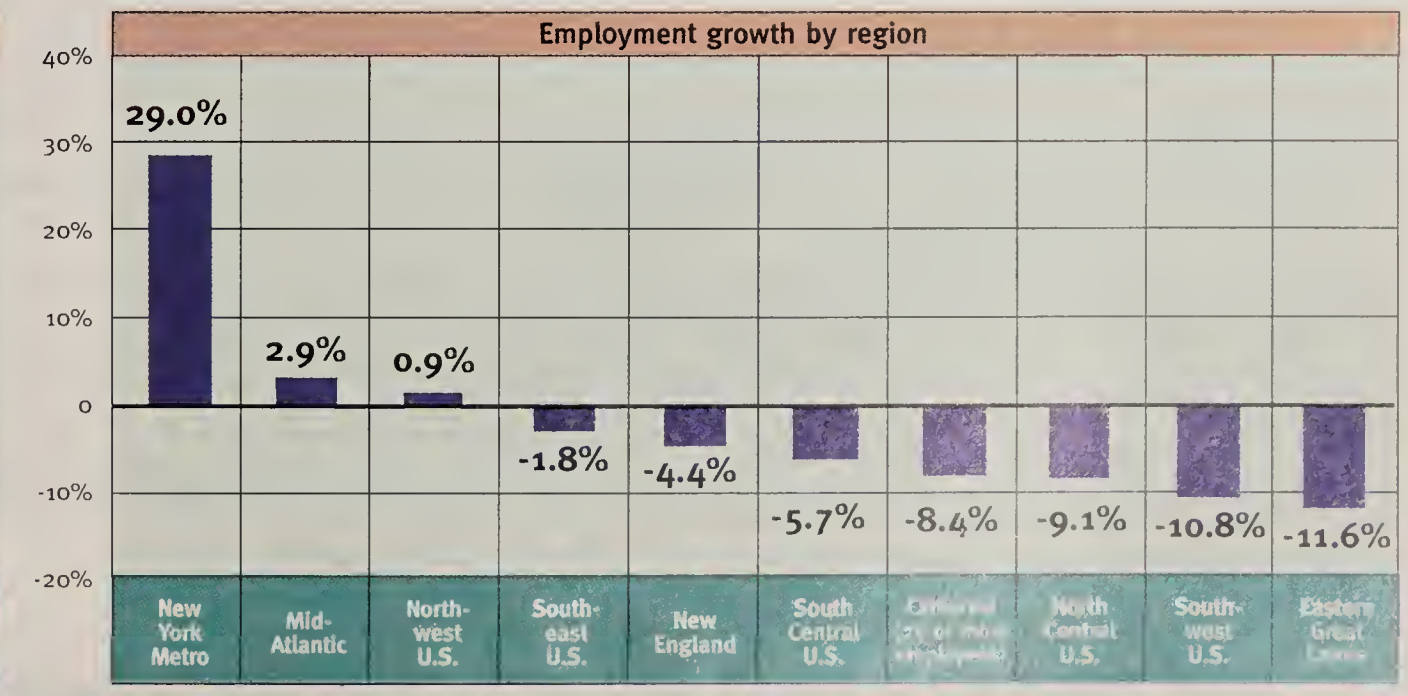

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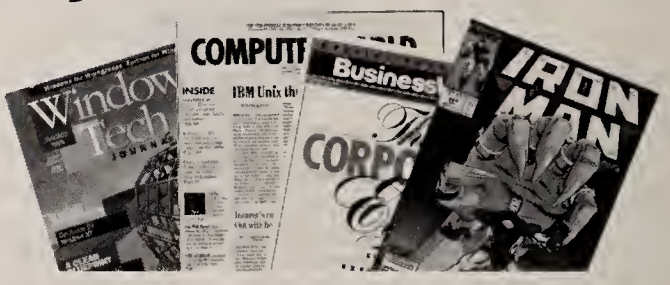

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Software marketing

Don't get swept up in 'upgrademania'

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By Joe King

SOFTWARE MARKETing is always changing. One of the most popular tactics — upgrades — has heads spinning.

Though keeping up with the latest upgrade may not be harmful to most companies, it has brought to light a few questionable selling practices in the retail channel.

There are actually two types of upgrade practices: the constant release of new upgrades, which hurts the consumer, and the competitive upgrade offer, which hurts the industry and encourages dishonesty.

In the first case, major product upgrades are usually preceded by direct mailers offering a "once in a lifetime" deal for the most recent version — but only if you act now. The catch is, the next release is usually announced two months later. Buyers can avoid losing out by paying attention to the market.

The increase in the number of new releases has added confusion to the practice of competitive upgrades. The competitive upgrade offer is used to woo buyers of one product to a competing product by offering an attractive price. To get the upgrade, resellers often require buyers to prove that they already own a copy of a "full" product.

Proof usually consists of the original disk of a competing product or the first page of the product's manual. Most often, it is the reseller's responsibility to send this proof to the software publisher.

The reason that proof is necessary is that an "upgrade" is actually identical to a full package only in less glitzy packaging. It comes with full documentation and installs just like a new package. The software publishers are actually trying to keep buyers from getting what amounts to a a full package at 50% to 300% off the original price.

However, when resellers were asked what they did with this documentation, store managers replied that it was "kept on file in case the publisher asked for it" — which never happened. Some even admitted to throwing it out or not collecting it at all.

In short, the process of filling out forms and tearing out manual pages of previous versions is a sham. In my experience, retailers and resellers are not required to report anything back to the software publisher.

Onus on retailer

What's wrong is that the burden is left entirely on the shoulders of the retailer to ensure the consumer's honesty. I think the software publishing industry is enabling widespread fraud by making upgrades identical to a full package. To make matters worse, software publishers practically encourage retailers to look the other way by not having some form of upgrade documentation reporting back to them. Why would any savvy consumer pay $395 for a new package when the upgrade is sitting right next to it on the shelf for $99?

The other ethical question raised is which price represents the real value for the software? If the software publisher makes an adequate margin on the upgrade price, the full retail must provide a windfall profit. If the publishers are not making a profit at the upgrade price, their stockholders should be upset. We call the practice "dumping" when the Japanese or Korean companies sell their products to the U.S. at no profit.

If the practice of competitive upgrades is to continue, a reporting requirement that ensures compliance with the upgrade policies must be put into place.

I wonder if my local Lexus dealer would accept the cover page from the owners manual of my 10-year-old Buick in return for 75% off the sticker price?

King is president of Crossroad Partners, a software publisher in Shrewsbury, N.J.

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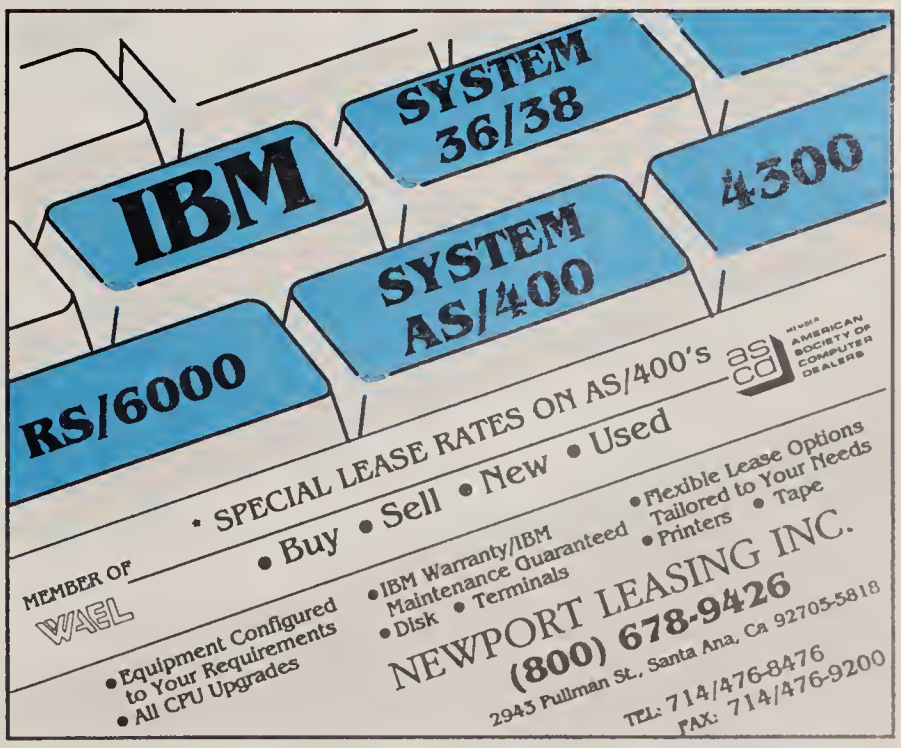

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Index of used computer prices

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PS/2 Model 55SX	$875	$750
PS/2 Model 60	$500	$475
ThinkPad 300	$1,550	$1,550
PS/2 Model 95-OKF	$3,300	$2,700
Compaq Portable II	$225	$325
Portable III	$400	$450
Portable 386	$750	$850
SLT-286	$650	$650
LTE-286	$700	$850
DeskPro 486/33I	$1,850	$1,850
Apple Macintosh SE	$650	$625
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Government	62,291
Utilities, Communications Systems, Transportation Services	58,516
Mining, Construction, Petroleum & Refining	17,618
Manufacturers of Computers & Peripherals	63,550
Systems Integrators, VARs, Computer Service Bureaus and Consulting	100,673
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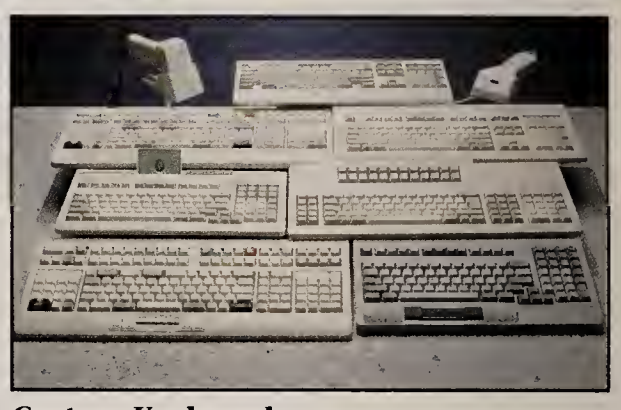

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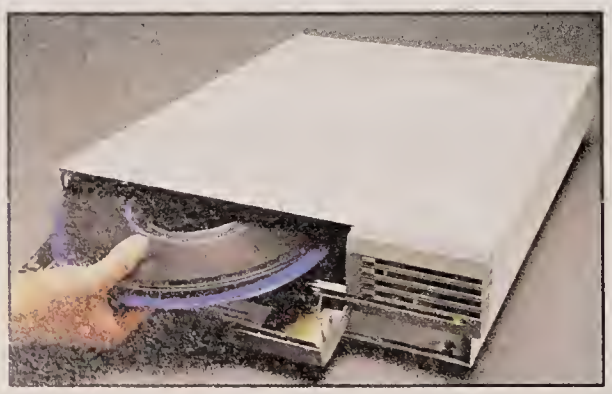

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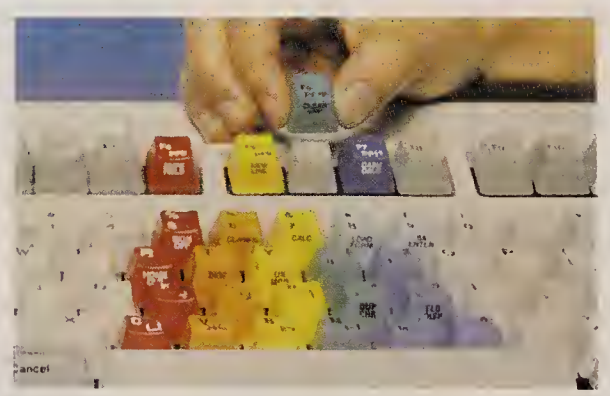

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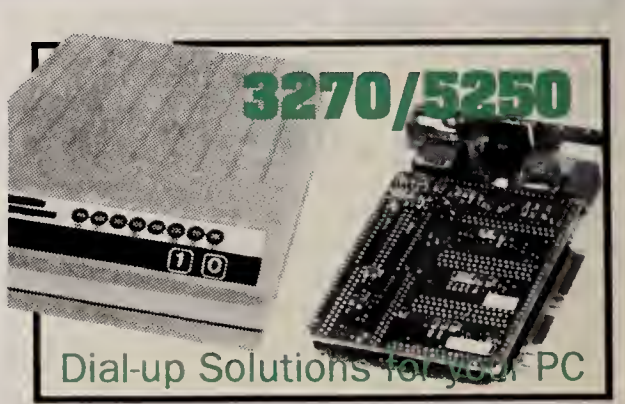

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Ultimate Corp.	19.0
Meca Software	16.4
General Datacomm Inds.	15.5
Maxtor Corp. (L)	14.0
American Software Inc.	13.7
4th Dimension	13.6
Easel Corp.	13.0
Commodore Int'l	12.5

Dollar

American Info Techs Corp.	3.88
Micro Focus	3.75
American Power Conversion (H)	3.13
Matsushita Electronics	2.75
4th Dimension	2.75
Harris Corp.	2.00
MCI Commmunications Corp. (H)	2.00
Analog Devices Inc. (H)	1.88

Losers

Percent

Wang Labs Inc. (B)	-50.0
Cray Computer	-34.3
Western Digital Corp.	-32.3
Frame Technology (L)	-29.9
Stratacom Inc.	-23.7
Network Computing Devices	-19.0
Digital Comm. Assoc.	-18.7
Proteon Inc.	-17.7

Dollar

Synoptics Communications	-5.38
Micron Technology (H)	-4.63
Cisco Systems Inc. (H)	-4.25
Texas Instruments (H)	-4.25
Frame Technology (L)	-3.63
Digital Comm. Assoc.	-3.63
Stratacom Inc.	-3.50
Microsoft Corp.	-3.38

Industry Almanac

Capital leapfrog

Big-systems vendors no longer dominate the market capitalization charts.

Software colossus **Microsoft Corp.** (MSFT) and semiconductor firm **Intel Corp.** (INTL) have both challenged **IBM**'s (IBM) traditional lead in recent months, although IBM's recovery to the mid-50s has widened the gap again.

Internetworking hardware vendors **Cisco Systems, Inc.** (CSCO) and **Cabletron Systems, Inc.** (CS) have charged up through the ranks during the past year. Cisco recently surpassed **Digital Equipment Corp.** (DEC) in market capital by doubling DEC's share price. —*Derek Slater*

Capital fellows

HIGH-TECH COMPANIES WITH THE HIGHEST MARKET CAPITALIZATION

Company	Closing price 3/15/93	Shares outstanding (in thousands)	Market capitalization (billions)
IBM	55	570,800	$31.39
Intel Corp.	118 5/8	217,449	$25.80
Microsoft Corp.	87 5/8	275,062	$24.10
Hewlett-Packard Co.	77 1/4	252,000	$19.47
Novell, Inc.	34 3/8	310,858	$10.69
Automatic Data Processing, Inc.	54 1/8	140,007	$7.58
Apple Computer, Inc.	57	121,156	$6.91
Electronic Data Systems Corp.	30 7/8	206,220	$6.37
Cisco Systems, Inc.	95 3/4	64,487	$6.18
Digital Equipment Corp.	46 1/8	129,000	$5.95
Oracle Corp.	36 1/8	142,041	$5.13
Computer Associates International, Inc.	25 1/2	167,278	$4.28
Compaq Computer Corp.	52	81,585	$4.24
Cabletron Systems, Inc.	89 3/8	28,108	$2.51
First Financial Management	85 1/8	57,892	$2.50
Newbridge Networks Corp.	58 3/4	38,803	$2.28
SynOptics Communications, Inc.	92 1/2	22,258	$2.06
Policy Management Systems	85 3/4	23,355	$2.00

Sources: Alex. Brown & Sons, Inc.; Montgomery Securities

Exch	52-Week Range			Mar 19 3PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES						**Off 3.9%**
OTC	35.13	9.63	3 COM Corp. (H)	32.38	0.13	0.4
NYS	76.63	56.25	American Info Techs Corp.	76.63	3.88	5.3
NYS	59.13	39.75	AT&T	58.63	1.63	2.9
OTC	3.56	0.75	Artel Communication Corp.	2.81	-0.19	-6.2
OTC	24.50	10.25	Banyan Systems Inc.	17.25	-3.00	-14.8
NYS	56.75	40.25	Bell Atlantic Corp.	53.13	0.63	1.2
NYS	57.50	43.38	Bellsouth Corp.	54.38	0.63	1.2
NYS	6.63	3.63	Bolt, Beranek & Newman	4.88	0.00	0.0
OTC	18.50	10.00	Brooktrout Technology	11.00	-2.00	-15.4
NYS	92.25	42.13	Cabletron Systems	84.00	-3.38	-3.9
OTC	34.50	17.75	Chipcom Corp.	30.00	-0.25	-0.8
OTC	96.50	33.00	Cisco Systems Inc. (H)	89.38	-4.25	-4.5
OTC	26.50	5.50	Compression Labs Inc.	12.63	-0.13	-1.0
OTC	4.63	0.88	Data Switch Corp. (H)	4.38	0.31	7.7
NYS	22.25	13.75	Digital Comm. Assoc.	15.75	-3.63	-18.7
OTC	13.75	7.00	Digital Systems Int'l Inc.	7.50	0.25	3.4
OTC	29.50	4.00	DSC Communications	25.88	-2.38	-8.4
OTC	9.50	4.75	Fibronix Int'l Inc.	7.75	-0.38	-4.6
OTC	37.00	10.50	Filenet Corp.	11.75	0.50	4.4
OTC	4.38	1.50	Gandalf Technologies Inc.	3.44	0.06	1.9
OTC	2.06	0.69	Gateway Communications	1.56	-0.25	-13.8
NYS	10.50	2.88	General Datacomm Inds.	10.25	1.38	15.5
ASE	4.13	2.00	Go Video	2.56	0.00	0.0
NYS	37.75	28.88	GTE Corp.	36.13	-0.25	-0.7
NYS	78.63	62.50	ITT Corp. (H)	78.63	0.63	0.8
OTC	44.38	29.50	MCI Commmunications Corp. (H)	44.38	2.00	4.7
OTC	12.75	2.25	Microcom Inc.	3.88	-0.63	-13.9
OTC	24.25	8.00	Netrix Corp.	8.50	-0.50	-5.6
OTC	19.00	9.63	Network Computing Devices	12.75	-3.00	-19.0
NYS	15.88	7.50	Network Equipment Tech.	7.50	-1.13	-13.0
OTC	23.25	8.00	Network General	13.50	-1.00	-6.9
OTC	15.75	8.50	Network Systems Corp.	10.50	-0.88	-7.7
OTC	60.25	13.63	Newbridge Networks Corp. (H)	55.13	-3.25	-5.6
NYS	48.00	30.50	Northern Telecom Ltd.	43.13	-0.63	-1.4
OTC	35.25	22.50	Novell Inc. (H)	33.00	-1.75	-5.0
NYS	92.50	69.13	Nynex Corp.	88.38	0.50	0.6
OTC	34.75	14.50	Octel Communications Corp.	25.75	-1.50	-5.5
OTC	8.00	3.38	Penril Data Comm Networks	4.44	-0.19	-4.0
OTC	45.75	10.25	Picturetel Corp.	21.88	-1.13	-4.9
OTC	15.75	6.38	Proteon Inc.	6.38	-1.38	-17.7
NYS	30.38	10.16	Scientific Atlanta Inc.	22.00	-0.50	-2.2
NYS	75.63	56.63	Southwestern Bell Corp.	72.63	0.63	0.9
NYS	31.25	20.75	Sprint Corp.	31.25	1.25	4.2
OTC	27.00	8.75	Standard Microsystems Corp	19.00	-0.50	-2.6
OTC	18.50	6.88	Stratacom Inc.	11.25	-3.50	-23.7
OTC	95.50	18.75	Synoptics Communications	85.75	-5.38	-5.9
OTC	7.13	4.25	Telebit Corp.	4.63	-0.50	-9.8
OTC	9.38	2.13	Telematics Int'l Inc.	7.25	-0.63	-7.9
OTC	25.50	13.38	US Robotics	20.25	0.25	1.3
NYS	43.88	32.88	U S West Inc.	42.25	1.50	3.7
OTC	46.00	12.00	Wellfleet Communications	39.75	-1.00	-2.5
OTC	22.00	7.00	Xircom	8.50	-0.50	-5.6
PC'S AND WORKSTATIONS						**Off 2.9%**
OTC	7.50	2.81	Advanced Logic Research	2.81	-0.31	-10.0
OTC	65.25	41.50	Apple Computer Inc.	54.00	-2.50	-4.4
OTC	24.25	11.25	AST Research Inc.	14.00	-0.63	-4.3
NYS	16.25	4.75	Commodore Int'l	5.63	0.63	12.5
NYS	58.50	22.25	Compaq Computer Corp.	48.25	-2.38	-4.7
OTC	49.88	15.00	Dell Computer Corp.	35.38	-1.50	-4.1
NYS	85.00	50.25	Hewlett Packard Co.	75.25	-1.88	-2.4
NYS	33.00	14.13	Silicon Graphics	30.38	-0.50	-1.6
OTC	41.00	22.50	Sun Microsystems Inc.	30.38	-2.25	-6.9
NYS	32.13	22.25	Tandy Corp.	26.38	0.00	0.0
NYS	9.75	5.00	Zenith Electronics	6.63	-0.63	-8.6
OTC	16.75	2.75	Zeos International Ltd.	5.13	0.00	0.0
LARGE SYSTEMS						**Off 6.1%**
ASE	18.38	6.63	Amdahl Corp.	7.88	0.00	0.0
NYS	14.00	4.75	Convex Computer	5.50	-0.38	-6.4
OTC	6.13	1.88	Cray Computer	2.88	-1.50	-34.3
NYS	44.50	19.00	Cray Research Inc.	26.38	-1.88	-6.6
NYS	13.88	7.13	Data General Corp.	12.88	-0.50	-3.7
NYS	59.13	30.38	Digital Equipment Corp.	45.75	-0.38	-0.8
NYS	38.63	26.63	Harris Corp.	37.00	2.00	5.7
NYS	100.38	45.88	IBM	54.25	-0.75	-1.4
OTC	22.00	5.50	Kendall Square Research (H)	18.63	-1.88	-9.1
NYS	110.00	83.00	Matsushita Electronics	98.25	2.75	2.9
OTC	17.00	6.00	Pyramid Technology	15.25	-0.50	-3.2
OTC	24.00	11.13	Sequent Computer Sys.	18.13	-0.50	-2.7
OTC	16.38	1.38	Sequoia Systems Inc.	2.38	0.06	2.7
NYS	49.75	29.50	Stratus Computer Inc.	34.88	0.63	1.8
NYS	16.88	9.88	Tanoem Computers Inc.	13.38	0.13	0.9
NYS	13.88	7.75	Unisys Corp.	13.50	0.00	0.0
ASE	6.13	0.06	Wang Labs Inc. (B)	0.50	-0.50	-50.0
SOFTWARE						**Off 1.9%**
OTC	56.50	25.25	Adobe Systems Inc.	43.13	-2.38	-5.2
OTC	26.50	10.25	Aldus Corp.	17.50	-0.88	-4.8
OTC	18.75	5.63	American Software Inc.	7.25	0.88	13.7
OTC	28.13	9.75	Ask Computer Systems (H)	25.75	0.25	1.0
OTC	56.50	27.75	Autodesk Inc.	43.00	-2.75	-6.0
OTC	25.50	3.50	Bachman Info. Systems	3.88	-0.19	-4.6
OTC	43.00	34.00	BGS Systems Inc.	41.00	0.00	0.0
OTC	84.13	37.25	BMC Software Inc.	51.75	-2.50	-4.6
OTC	28.25	17.00	Boole & Babbage	26.25	0.50	1.9
OTC	71.50	17.50	Borland Int'l Inc.	22.75	0.00	0.0
OTC	8.88	3.00	CE Software	3.44	-0.31	-8.3
ASE	35.00	9.38	Cheyenne Software Inc.	29.25	-1.25	-4.1
OTC	19.50	8.25	ChipSoft	13.00	-0.38	-2.8
OTC	9.75	5.63	Cognos Inc.	6.75	0.00	0.0
NYS	27.38	10.88	Computer Associates	24.13	-0.75	-3.0
NYS	12.38	4.00	Computervision Corp.	5.25	-0.38	-6.7
OTC	18.50	6.75	Comshare Inc.	9.00	0.00	0.0
OTC	17.25	10.75	Corel Corp.	14.75	0.50	3.5
OTC	41.25	6.00	Easel Corp.	10.88	1.25	13.0
OTC	25.25	12.00	4th Dimension	23.00	2.75	13.6
OTC	24.75	7.50	Frame Technology (L)	8.50	-3.63	-29.9
OTC	22.25	12.50	Group I Software	15.00	0.00	0.0
OTC	35.25	23.25	Gupta	24.25	-2.75	-10.2
OTC	8.75	3.50	Hogan Systems Inc.	7.75	0.00	0.0
OTC	25.75	12.25	IMRS	16.50	0.25	1.5
OTC	34.75	18.50	Information Resources	28.50	-2.25	-7.3
OTC	42.00	12.13	Informix Corp.	32.25	-1.25	-3.7
OTC	19.25	11.00	Intergraph Corp.	12.00	-0.25	-2.0
OTC	13.63	7.75	Interleaf Inc.	9.63	-0.38	-3.8
OTC	18.25	7.00	Intersolv Inc.	8.00	-0.50	-5.9
OTC	17.75	9.50	Knowledgeware Inc.	9.75	-0.38	-3.7
OTC	54.75	28.75	Legent Corp.	40.50	-1.75	-4.1
OTC	36.75	14.75	Lotus Development	26.00	-0.50	-1.9
OTC	23.00	15.25	MathSoft	15.25	-3.00	-16.4
OTC	23.25	5.50	McAfee Associates	7.50	-0.25	-3.2
OTC	8.88	1.88	Meca Software	8.88	1.25	16.4
OTC	19.00	5.25	Mentor Graphics	10.00	0.63	6.7
OTC	46.00	27.25	Micro Focus	37.00	3.75	11.3
OTC	20.50	6.50	Micrografx Inc.	8.63	0.63	7.8
OTC	95.00	65.50	Microsoft Corp.	84.63	-3.38	-3.8
OTC	36.88	12.00	Oracle Corp. (H)	34.63	0.25	0.7
OTC	31.88	13.13	Parametric Technology	28.50	-0.88	-3.0
OTC	40.50	22.50	Peoplesoft	27.75	-2.38	-7.9
OTC	11.00	3.50	Phoenix Technologies	4.13	-0.63	-13.2
OTC	40.00	29.50	Powersoft (L)	30.50	-2.75	-8.3
OTC	25.00	11.25	Platinum Technology	13.00	-2.75	-17.5
OTC	61.50	29.00	Progress Software Corp.	45.00	-1.75	-3.7
OTC	21.00	2.94	Quarterdeck Office Sys.	3.50	-0.50	-12.5
OTC	26.50	11.75	Rainbow Technologies Inc.	19.50	-1.25	-6.0
OTC	22.25	4.00	Rasterops	6.88	-0.63	-8.3
OTC	15.25	3.63	Ross Systems	13.88	1.25	9.9
OTC	27.25	8.50	Sapiens USA Inc.	21.50	-1.75	-7.5
OTC	25.38	6.75	Software Publishing Corp.	13.13	0.25	1.9
OTC	9.13	2.00	Software Toolworks Inc.	8.13	0.38	4.8
OTC	5.13	0.75	Spinnaker Software	2.25	0.19	9.1
OTC	15.00	3.25	State of the Art	11.25	-0.75	-6.3
NYS	24.50	13.75	Sterling Software Inc. (H)	24.50	1.25	5.4
OTC	20.25	8.00	Struct. Dynamics Research	15.75	-2.00	-11.3
OTC	62.25	21.00	Sybase Inc.	57.50	-1.75	-3.0
OTC	47.50	5.88	Symantec Corp.	11.63	-0.25	-2.1
NYS	13.50	5.25	Systems Center Inc.	8.75	0.00	0.0
OTC	25.50	10.00	System Software Assoc.	14.50	1.50	11.5
OTC	9.63	2.50	Trinzic Corp.	4.63	0.13	2.8
OTC	22.75	9.13	ViewLogic Systems	16.88	-2.38	-12.3
OTC	23.75	8.13	Walker Interactive Systems	9.00	-0.38	-4.0
OTC	4.31	1.38	Wordstar	2.50	0.19	8.1
SEMICONDUCTORS						**Off 5.4%**
NYS	24.50	7.38	Advanced Micro Devices (H)	23.00	-0.50	-2.1
NYS	20.63	9.00	Analog Devices Inc. (H)	20.63	1.88	10.0
OTC	20.13	7.63	Atmel Corp.	17.38	-1.38	-7.3
OTC	11.75	3.13	Chips and Technologies	4.00	0.44	12.3
OTC	39.75	16.25	Cirrus Logic	25.13	-3.38	-11.8
NYS	15.75	7.38	Cypress Semiconductor Corp	10.63	-0.63	-5.6
NYS	16.13	7.00	Dallas Semiconductor	14.25	-1.00	-6.6
OTC	121.25	46.50	Intel Corp.	115.00	-2.75	-2.3
NYS	14.13	4.88	LSI Logic Corp. (H)	12.63	-1.25	-9.0
NYS	28.50	12.88	Micron Technology (H)	23.13	-4.63	-16.7
NYS	66.50	36.44	Motorola Inc. (H)	63.25	-1.50	-2.3
NYS	14.13	8.25	National Semiconductor	13.00	-0.25	-1.9
OTC	21.25	8.25	Sierra Semiconductor	12.75	-0.75	-5.6
OTC	38.50	22.25	SynOpsys	27.13	-1.88	-6.5
NYS	63.38	31.50	Texas Instruments (H)	57.13	-4.25	-6.9
OTC	9.88	6.00	VLSI Technology	6.88	-0.25	-3.5
OTC	7.63	2.13	Weitek	6.88	-0.13	-1.8
ASE	9.63	3.50	Western Digital Corp.	5.50	-2.63	-32.3
OTC	37.50	14.50	Xilinx (H)	33.25	-2.88	-8.0
OTC	27.84	12.50	Zilog Inc.	23.75	-0.25	-1.0
PERIPHERALS AND SUBSYSTEMS						**Off 0.6%**
OTC	31.00	10.38	American Power Conversion (H)	30.38	3.13	11.5
OTC	20.16	13.66	Banctec Inc. (S) (L)	16.88	-0.63	-3.6
OTC	20.75	9.25	Cambex Corp.	11.50	-0.13	-1.1
ASE	18.38	7.25	Cognitronics Corp.	7.88	-1.25	-13.7
NYS	25.50	16.13	Conner Peripherals	16.38	-1.25	-7.1
OTC	38.50	10.75	Creative Technologies Inc.	33.00	1.75	5.6
OTC	30.75	14.25	Data Race Inc.	21.50	-1.00	-4.4
ASE	19.63	4.75	Dataram Corp.	9.00	0.50	5.9
NYS	28.75	7.25	EMC Corp.	24.25	-1.38	-5.4
OTC	10.50	5.38	Emulex Corp.	6.88	-0.25	-3.5
OTC	19.00	13.25	Evans & Sutherland	16.50	0.50	3.1
OTC	39.25	12.00	Exabyte	15.00	1.25	9.1
OTC	26.00	7.09	Intelligent Info. Systems	21.50	0.25	1.2
OTC	8.88	3.88	Iomega Corp.	4.75	0.38	8.6
OTC	34.75	5.75	IPL Systems Inc.	6.75	0.00	0.0
OTC	24.00	10.75	Komag Inc.	20.25	-1.75	-8.0
OTC	19.63	6.88	Maxtor Corp. (L)	8.13	1.00	14.0
OTC	12.38	6.88	Micropolis Corp.	6.88	-0.88	-11.3
NYS	109.88	85.50	3M Corp (H)	109.75	1.25	1.2
OTC	7.75	4.00	Printronix Inc.	7.25	0.38	5.5
NYS	17.13	6.88	QMS Inc.	15.00	0.00	0.0
OTC	17.88	12.13	Quantum Corp.	13.50	-1.50	-10.0
OTC	12.75	3.75	Radius Inc.	4.88	-0.38	-7.1
NYS	16.25	7.50	Recognition Equipment	12.63	-0.75	-5.6
OTC	13.88	5.50	Rexon Inc.	6.63	0.63	10.4
OTC	22.38	12.00	Seagate Technology	15.00	-1.75	-10.4
NYS	68.75	18.00	Storage Technology	25.00	-0.38	-1.5
NYS	25.75	16.88	Tektronix Inc. (H)	25.75	0.25	1.0
NYS	88.88	66.75	Xerox Corp.	82.13	-0.63	-0.8
SERVICES						**Up 0.8%**
OTC	23.50	12.16	American Mgmt. Systems	22.63	0.50	2.3
NYS	5.38	3.00	Anacomp Inc.	4.00	0.25	6.7
OTC	35.75	16.00	Analysts Int'l	29.25	-1.50	-4.9
NYS	56.13	38.75	Auto Data Processing	52.13	-2.00	-3.7
NYS	17.25	9.41	Cerioian Corp.	15.38	0.50	3.4
NYS	17.38	12.50	Comoisco Inc.	16.63	0.75	4.7
OTC	13.00	6.75	Computer Horizons	10.63	-0.38	-3.4
NYS	80.50	57.00	Computer Sciences	75.00	-0.88	-1.2
NYS	9.75	7.00	Computer Task Group	7.50	-0.25	-3.2
NYS	40.50	22.00	CompUSA Inc.	29.50	-0.88	-2.9
OTC	18.50	6.00	Corporate Software	11.75	-0.25	-2.1
OTC	30.75	7.63	Egghead Discount Software	8.25	0.38	4.8
NYS	35.88	25.25	General Motors E (EDS)	30.75	-0.38	-1.2
OTC	25.50	9.25	Inacom Corp.	19.25	-1.50	-7.2
OTC	22.25	6.25	Intelligent Electronics	14.38	-0.25	-1.7
OTC	14.38	6.63	Merisel	12.00	1.25	11.6
OTC	13.50	5.75	Microage Inc.	12.75	-0.25	-1.9
OTC	42.00	21.66	Paychex (H)	40.00	1.25	3.2
NYS	86.88	59.75	Policy Management Sys. (H)	85.00	0.88	1.0
NYS	35.38	16.81	Reynolds and Reynolos	33.88	0.25	0.7
OTC	31.75	22.00	SEI Corp.	29.25	0.00	0.0
OTC	24.38	16.88	Shared Medical Systems	21.63	-0.38	-1.7
OTC	14.38	5.75	SHL Systemhouse	10.13	-0.25	-2.4
OTC	29.25	18.25	Software Spectrum Inc.	24.25	0.25	1.0
OTC	33.75	20.75	Sungard Data Systems	32.63	0.13	0.4
NYS	3.13	1.13	Ultimate Corp.	3.13	0.50	19.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

Software sales soar

Despite raging price promotions, North American sales of PC applications reached $1.71 billion in the fourth quarter of last year, up 9.6% from 1991, according to the **Software Publishers Association.** Sales in 1992 totaled $5.75 billion, a healthy 14% increase from a year earlier. DOS sales continued to drop in the fourth quarter, while Microsoft Corp. Windows applications grew 64% to $639 million. Apple Computer, Inc. Macintosh applications rose 16% to $277 million.

Adobe results up

Adobe Systems, Inc. earned $15.4 million in the first quarter ended Feb. 26, a 14% increase from the comparable period last year. Earnings were boosted by $3.9 million from the sale of stock. Revenue climbed 10% to $68.5 million, the Mountain View, Calif., software developer said.

SHORT TAKES **Sun Mierosystems, Inc.** is developing wireless communications technology with a private Russian company, **Elvis + Ltd.** Sun also purchased a 10% interest in the firm.... **Control Data Systems, Inc.** in Arden Hills, Minn., has agreed to buy **Evernet Systems, Inc.**, a $40 million network systems integrator based in Los Angeles. The transaction is expected to be finalized in May.... **Wall Data, Inc.**, a Redmond, Wash., software vendor, has floated an initial public offering (IPO) of 2.8 million shares, priced at $20 a share.... **Dialogic Corp.**, a Parsippany, N.J., developer of call processing systems, registered an IPO of $2.5 million that is expected to fetch between $10 and $12 a share .... **NetWorth, Inc.** in Dallas said it expects to break even in the fiscal third quarter that will end March 31, below earlier expectations.

Wang unveils reorganization

By Melinda-Carol Ballou
LOWELL, MASS.

■ Leaving behind its minicomputer legacy, Wang Laboratories, Inc. filed a reorganization plan last week that reiterates a sharpened focus on software and network integration services.

The plan, developed in conjunction with key creditors, is slated to be heard by a bankruptcy court judge within three months, company officials said. The plan is expected to bring the company back to profitability by 1994 as a $1.2 billion enterprise, noted Joe Tucci, Wang's president and chief executive officer.

Wang lost $357 million in 1992, on revenue of 1.9 billion. During the first six months of fiscal '93, Wang had revenue of $711 million, with a net loss of $66 million.

The reorganized company has been divided into five geographic business units, with horizontal product units focusing on software (imaging, office and computer-aided software engineering tools) and network and systems integration, as well as the vestigial VS group. The business units will be responsible for their own profit and loss.

As a result of the new organization, Wang will lay off approximately 3,000 employees, mainly in the VS development and manufacturing groups, the direct sales force and corporate support, officials said.

Wang will not develop future versions of its VS line, though it will continue to service existing platforms.

Tough competition

The software and services road Wang is following will not be an entirely smooth one. Nearly all the other once-proprietary hardware vendors — Digital Equipment Corp., Groupe Bull, Unisys Corp. and IBM — are seeking to gain revenue through systems integration services, and the competition is fierce.

Analysts questioned whether Wang will be able to deliver on all of its products and services to customers as it downsizes.

"There are a lot of questions, and you cannot predict exactly how it will go," said Jim Brennan a senior director at WorkGroup Technologies, Inc., a market research firm in Hampton, N.H.

A revitalized Wang is betting on deals such as an alliance inked recently with Hewlett-Packard Co. The two companies will jointly market Wang's software products on HP 9000 platforms. This will provide yet another migration platform for VS customers, adding to IBM's Application System/400 and RISC System/6000 and PC local-area network environments previously available to Wang's installed base.

The strategy has merit, other industry analysts said.

"I think it will work and will stabilize the installed base," said Chris Christiansen, a director at International Data Corp., a market research firm in Framingham, Mass. "The false prophets were proven wrong on Wang. They are not going out of business and being broken up; there is still a fundamental value there."

Fresh start?

Salient details of Wang's reorganization plan as approved by a creditors committee:

- **Business groups** formed to focus on software and network integration services and five geographic regions; head count cut from 9,300 to 6,200.
- **Ownership** of the firm will be transferred to certain classes of creditors. New stock will be issued.
- **Shareholders** of Class B and Class C stock will get seven-year warrants to purchase 20% of stock in the new company.
- **New board** will be elected pursuant to the plan's acceptance by bankruptcy court.

Unisys banks on services

By Thomas Hoffman
BLUE BELL, PA.

After five consecutive profitable quarters, Unisys Corp. is counting on professional services to keep its momentum up.

The professional services push will emphasize systems integration, outsourcing and other information services such as business process re-engineering, said Victor E. Millar, president of Unisys Worldwide Professional Services.

The vendor's plan of attack will be concentrated on the four major vertical markets that last year brought Unisys 80% of its overall revenue: public sector, financial services, airlines and telecommunications.

Millar predicted Unisys would attain 12% to 15% revenue growth in professional services this year.

In addition, Unisys plans to provide expanded services such as business process re-engineering and information research such as market, competitive and technology analysis for customers.

Unisys' plans also offer benchmarking services, which would enable clients to compare how other organizations have successfully handled specific departmental tasks.

Some analysts said they like the vendor's chances of success, especially with a 60,000-customer installed base.

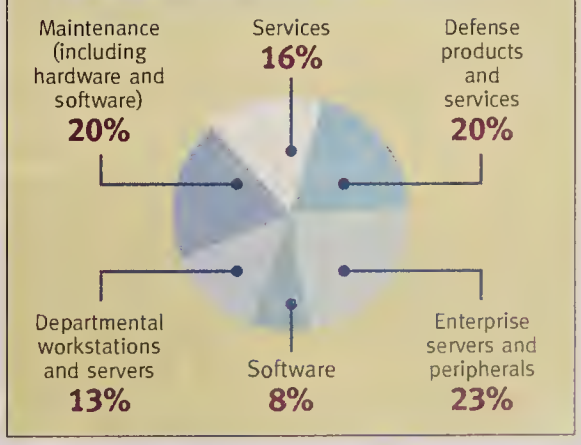
"I think they have a fighting chance because of their big customer base, but they are getting a little bit of a late start," noted William J. Milton Jr., a financial analyst at Brown Brothers Harriman & Co. in New York.

Others were not so sure. Fred Joy, a senior analyst at Meta Group, Inc. in Westport, Conn., said he does not think Unisys can compete globally with industry heavyweights such as Electronic Data Systems Corp. but that Unisys can succeed by focusing on its four primary lines of business.

Serving somebody

Unisys hopes its services business, which includes systems integration and outsourcing, will grow by 12% to 15% this year

PERCENT OF 1992 REVENUE; TOTAL: $8.4 BILLION



Source: Unisys Corp. CW Chart: Tom Monahan

Even outlook

Unisys expects 1993 revenue to be flat, compared with 1992's $8.4 billion, primarily because of weak sales in Europe and Japan. However, the company's continued cost-cutting initiatives should aid profitability.

Unisys already brings some experience to the table in systems integration and outsourcing. For example, last year, Unisys landed two impressive deals here in the U.S. — a $45 million outsourcing deal in January with Subaru of America, Inc. and a 10-year, $56 million outsourcing pact with California Republic Bank, announced in September [CW, Oct. 5, 1992].

Last year, Unisys snared more than $100 million in outsourcing contracts, according to Dewaine L. Osman, Unisys' vice president of corporate planning.

Unisys customers said they welcome the services-oriented approach. "I think they have a very bright future in professional services. Unisys has downsized to the point where they're ready to face the future, and professional services is a good addition," said Pamela Ackley, software manager at Carlton Computer Support Services, Inc. in Beltsville, Md.

Wysiwyg

Great Names

THOMAS PASCAL PARHAM
Lead programmer analyst, TransAmerica Occidental Life Insurance Co., Los Angeles

ON THE AIR

A weekly half-hour program dubbed **"Geek of the Week"** will begin to air over the Internet late this month. Internet Talk Radio will use encoding formats and conversion programs to support audio playback of the interviews on all major environments. The first interviews are with notable members of the Internet community — Marshall T. Rose, author and programmer, and Milo Media, NASA Science Internet manager.

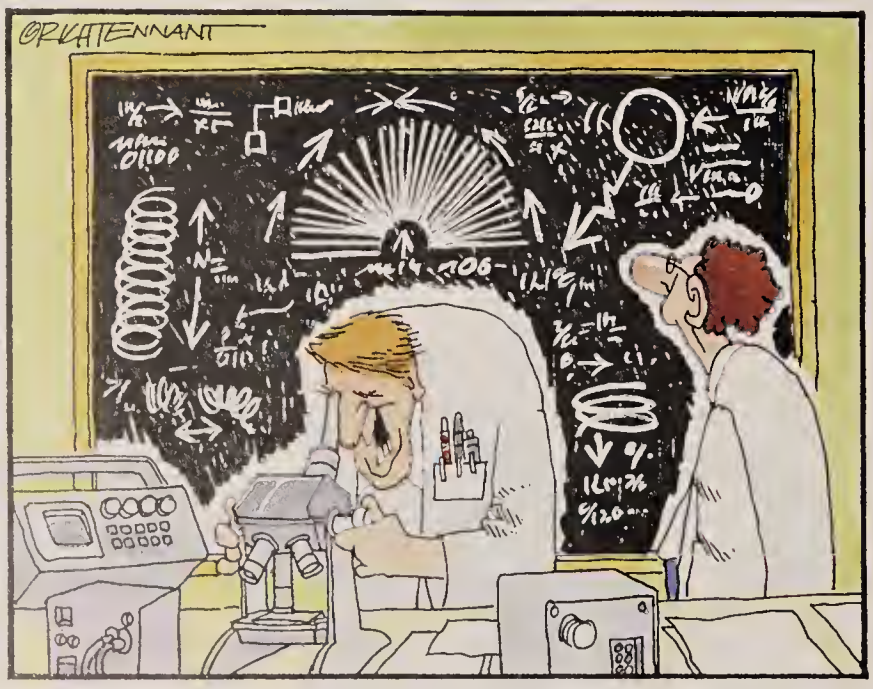
Have any horror stories about misfired E-mail messages? We want to know about them. Call Stefanie McCann at (800) 343-6474 or fax to (508) 875-8931.

HIGH-TECH MOUSETRAP

The lads at Rentokil's Pest Control Service in the UK have invented a better mousetrap, and they expect the world to beat a path to their door. The poison-free Mouse Alert system consists of two infrared beams and a radio transmitter. When a mouse enters the trap and breaks both beams (there are two to prevent false alarms), the transmitter signals the controller to shut the trap doors. The controller, which can serve over 200 traps, automatically dials the phone number of a pest-control technician, who then removes the mouse "for humane disposal" off-site and resets the trap. The market: food, drug and electronics companies that fear contamination from even a single mouse.

Source: Rentokil Ltd., West Sussex, England

The Fifth Wave *by* Rich Tennant



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Inside Lines

An interface for all seasons

Microsoft is planning to broaden its Open Database Connectivity (ODBC) vendor-neutral programming interface for database connectivity among PC, minicomputer and mainframe systems. Microsoft is reportedly funding Rochester Software Connection, Inc. to develop software that will allow Microsoft to implement ODBC on IBM's AS/400 minicomputers. The product, currently in alpha testing, would allow desktop devices running Microsoft's Windows to access the AS/400 database. Microsoft is expected to begin shipping the product this fall, upon the release of its Access Version 1.2 software.

Doing it their way

Sun is moving ahead with migrating its manufacturing operations to a client/server scheme [CW, March 15]. The company has quietly hired Computer Sciences Corp. (CSC), under a $27 million outsourcing contract, to operate its mainframe-based manufacturing software at a San Diego data center while it develops a client/server version of MRP-II with Oracle to run on Sun hardware. CSC will assist in the implementation and is discussing a strategic alliance with Sun to jointly market the system once the in-house job is complete. Sun has an option to cancel the 39-month outsourcing contract whenever it thinks the client/server system is ready.

More to come

Cisco Systems says the first draft of Advanced Peer-to-Peer Internetworking (APPI), scheduled for release in June, will not be able to interact with IBM's APPN Network Node. The primary reason: Cisco Systems and the APPI Forum do not want to mess with any technology that involves IBM patents. However, the forum is working on a connection between APPI and APPN Network Nodes, aware that many users will want to combine the two types of installations. APPN is gaining ground with IBM shops that want a more dynamic, flexible way to configure and administer their Systems Network Architecture networks, while APPI promises equivalent functions over a TCP/IP backbone.

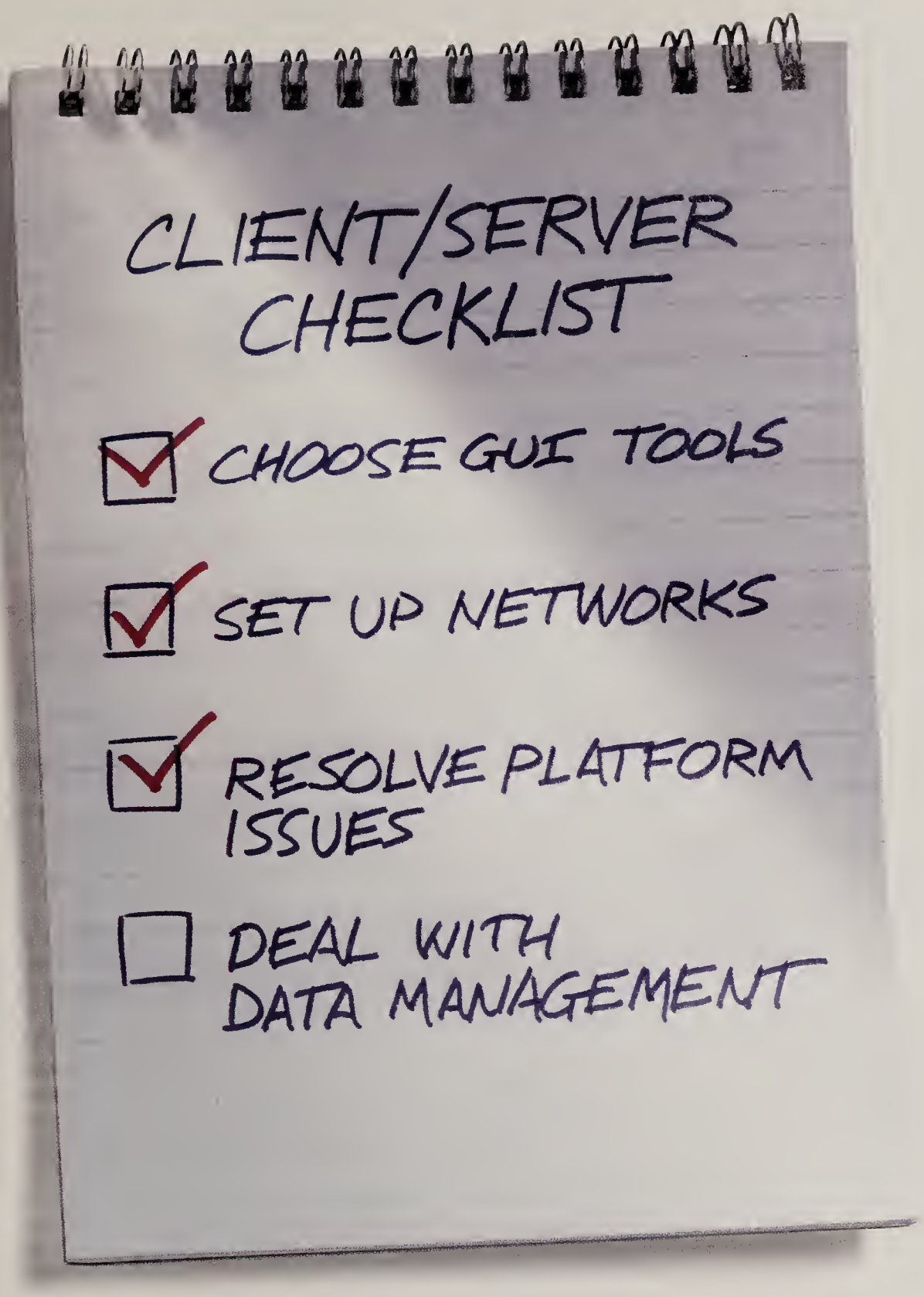
Dell on wheels

Dell is readying a replacement for its SE line of high-end servers, according to sources. The coming product takes the cabinet of Dell's defunct multiprocessor system, keeps the drive bays and puts in Intel's Pentium chip and the Peripheral Component Interface local bus (see story page 2). The cabinet, which was designed with wheels to make it easier to move around, "looks like R2-D2," one source said. Dell had targeted this product for a mid-April release with a 486 processor in it, but sources said the date may have slipped.

Making a new CASE

Now that KnowledgeWare is part of HP's Unix-based SoftBench application development framework, the Atlanta-based company has to step up plans to roll out Unix products that have been promised for more than a year. A Unix code generator is due late this year, according to a product representative. Meanwhile, ADW, the company's CASE workbench, will support SQL by late summer, with full-fledged support for Oracle and Sybase databases by late 1993, the representative added.

The humor highlight of the Unix unity press conference at UniForum last week was Microsoft's Scott McNealy, who finally said the "M" word in public. That's M for Motif, the GUI from the Open Software Foundation that Sun has fought against for years with its own OpenLook GUI. McNealy was called to the stage to say: "I really love the concept of Motif." At first he blurted out "SPARC" and then "marriage," but he finally got it out. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*



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